RELATIONAL STRATEGY, BUSINESS SCOPE, AND FIRM PERFORMANCE: EVIDENCE FROM SUPPLIER-CLIENT RELATIONSHIPS IN KNOWLEDGE-BASED SERVICES

BY

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DISSERTATION

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ABSTRACT

This dissertation examines the implications on the performance and business scope of knowledge-based service firms ("suppliers") that build deeply embedded exchange relationships with their clients. Prior research in the relational view has revealed the potential for firms to gain advantages (but also to become exposed to hazards) through close inter-organizational relationships characterized by greater levels of relationship-specific investments (or "relational commitments"). However, theory development and empirical examinations in the relational view have largely been at the level of the dyad. Thus, the firm-level impacts from deeper commitments across a firm's portfolio of relationships, and whether firms can generate competitive advantages from being a more relational partner, are less understood.

In my first empirical study (chapter two), I extend the relational view by examining the firm-level growth performance impacts of supplier firms choosing a more embedded relational strategy across their portfolio of client relationships. I find that suppliers who receive greater relational commitments from their existing clients can gain advantages for growing their business, but unilateral commitments by suppliers may not provide similar advantages. Rather, unilateral supplier commitments may be hazardous for supplier growth performance. Furthermore, consistent with the joint value-maximizing perspective of the relational view, I find bilateral, or mutual, relational commitments by suppliers and clients provide the greatest opportunity for supplier growth. By contrast, strong relational commitments constrain a supplier from taking advantage of more broad-based demand growth within the business domains in which that supplier operates, thereby negatively impacting supplier growth performance.

In my second empirical study (chapter three), I extend the relational view -- and connect corporate strategy with business strategy -- by providing a novel, relational theory of corporate diversification. I show that the advantages suppliers gain in sourcing new business from existing

clients lead those suppliers to expand their business scope in response to diversification by their clients. Furthermore, I reveal that this "client-led diversification" effect is strengthened by suppliers' client-specific knowledge and clients' relational commitment to suppliers, and when suppliers hold greater excess resource capacity.

My third empirical study (chapter four), also connects the relational view and corporate strategy literatures by investigating how a broader portfolio of businesses impacts supplier survival, and how a supplier's client management strategy moderates this scope-survival relationship. I find that suppliers gain survival advantages through a more diversified portfolio of client services, and these supplier scope-survival advantages are enhanced when suppliers dedicate a greater fraction of their business to serving long-term clients. In addition, a supplier's scope-survival advantage is also increased when their clients have a greater presence in fast-paced, innovative markets, relative to the markets within the supplier's own business portfolio.

I test my dissertation predictions using detailed longitudinal panel data on legal patent prosecution work outsourced by corporate clients to patent law firms. The findings provide nuanced insights into the value of relationship-specific investments for firm performance and business scope, and test the limits to which deeply embedded relationships provide firm-level advantages.

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Years ago, if someone had told me that one day I would be graduating as a PhD from an American Big Ten university, I would probably have asked what a Big Ten university was. It's hard to summarize the last six years in a few pages, and to identify and thank everyone who has guided, encouraged, pushed, and finally kicked me over the line, but suffice to say, a lot of people have played their part.

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CHAPTER ONE

INTRODUCTION

Client relationships are critical strategic assets for knowledge-based service firms (e.g., law firms, accounting firms, advertising agencies, and management consultancies), and creating and capturing value from clients are fundamental drivers of competitive advantage for these firms (Maister, 1993). Salient to the strategies of knowledge-based service firms (hereafter, "suppliers") for attracting, maintaining, and deriving value from clients is the building of deeply embedded exchange relationships (Baker 1990; Baker, Faulkner, & Fisher 1998; Chatain, 2011; Levinthal & Fichman, 1988; Rogan, 2014a). Extant research has shown that embedded supplier-client exchange relationships often provide significant advantages for suppliers in capturing new business from clients (Chatain, 2011; Maister, 1993) and increasing exchange value (Dyer, 1997; Dyer & Chu, 2003), while these strong ties are typically associated with relationship stability and longevity (Kang, Mahoney, & Tan, 2009; Mayer, Somaya, & Williamson, 2012; Moeen, Somaya, & Mahoney, 2013; Seabright, Levinthal & Fichman, 1992).

Theoretical explanations for creating and capturing superior value from inter-organizational exchange relationships are a central concern of the literature in the relational view (e.g., Dyer & Singh, 1998; Kale, Singh, & Perlmutter, 2000; Madhok & Tallman, 1998). In contrast to transaction cost economics, which is focused on ex ante cost minimization from the perspective of a single exchange partner (Williamson, 1975), creating value through inter-organizational strategy fundamentally concerns the recognition of the other exchange partner (Zajac & Olsen, 1993). The central theory advanced by the relational view is that greater relationship-specific investments (or *relational commitments*) build inter-organizational relational assets which enable exchange partners to jointly create greater relationship value (i.e.,

surplus profits) than they could achieve independently (Dyer & Singh, 1998; Zajac & Olsen, 1993).

Relational assets can create superior exchange value through a number of different mechanisms. First, relational assets may provide these relational advantages through increasing firm revenues. Exchange partners can increase revenues through the joint creation of co-specialized inter-organizational resources and capabilities, and the combining of complementary assets (Dyer & Singh, 1998). These unique, productive resources (Madhok & Tallman, 1998) have inimitable and non-substitutable attributes which can drive and sustain firm competitive advantage (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). Moreover, the focus by exchange partners on *long term* joint value creation, rather than short term gains through minimizing transaction costs, provides economic safeguards on relationship-specific investments, and increases the net present value of relational assets (Dyer & Singh, 1998).

Second, relational assets can provide value through the efficient production of exchange output and the reduction of relationship governance costs. For example, specialized inter-organizational knowledge transfer routines creates efficiencies in communication (Zollo, Reuer, & Singh, 2002) and supports the development of partner-specific absorptive capacity (Zahra & George, 200), that, in turn, can increase the quality, reliability and speed of exchange output (Asanuma, 1989; Dyer, 1996). In addition, greater familiarity and trust between exchange partners, and the desire to preserve relationship value over the longer term, can lower the costs of contracting over exchanges (Macneil, 1980; Williamson, 1979; 1985; Zaheer & Venkatraman, 1995) by promoting less formal, and self-enforcing, mechanisms of relationship governance (Macauley, 1963; Macneil, 1980; Telser, 1980).

Third, relational assets can create value for exchange partners by reducing risk. In the

pursuit of higher revenues, firms naturally take on a certain level of strategic risk. A stable stream of revenues from embedded exchange relationships may, on the one hand, allow firms to be more risk averse in that they do not need to take on risky ventures to generate profits, or, on the other hand, may provide a "safety net" that *allows* firms to take on high-reward, yet high-risk ventures, but reduces the impacts of downside loss.

However, given the criticality of client relationships for supplier value creation, it is surprising that, compared to other areas of management scholarship, and even research on other types of inter-organizational relationships (e.g., strategic alliances), *relatively little is understood about the strategies that suppliers formulate and implement to manage client relationships and what the performance consequences of those strategies are*. Furthermore, the relational view is a theoretical perspective that has largely been developed and applied at the level of the dyad, and therefore *the implications for firm-level strategy and performance from relationship-specific investments are less clear*.

The small body of research that has examined the composition of exchange relationships at the firm (or portfolio)-level suggests suppliers may not necessarily vary their client management strategies at the dyadic-level. Rather, across their portfolio of clients, suppliers may implement either a more "relational" (i.e., embedded, committed) or "discrete transactional" (i.e., arms-length, flexible) strategy (Baker et al., 1998; Broschak, 2004; Dyer, 1997; Moeen et al., 2013). Under a relational strategy, the propensity for supplier-client exchange may, largely, be driven by the underlying value created from relationship-specific investments. The desire to preserve relationship value into the future aligns the incentives of exchange partners and induces cooperative behavior (Axelrod, 1984; Gulati, 1995; Vanneste & Frank, 2013). In turn, existing clients become fertile ground for supplier new business (Chatain, 2011; Maister, 1993; Mayer et

al., 2012; Moeen et al., 2013). In contrast, exchange relationships following a discrete transactional approach (Macneil, 1980) are grounded in neoclassical economics and classical contracting approaches (Williamson, 1985), in which no exchange relationship need precede the transaction, and there is no commitment for exchanges in the future. One important distinction, therefore, between relational and discrete transactional approaches is that a relational approach creates value from strategies of commitment to the other partner, but which may constrain the formation of new relationships, while a discrete transactional approach creates value from strategies that enable market flexibility but are less effective for the economic bonding of exchange partners (Ghemawat & del Sol, 1998; Moeen et al., 2013).

One strategy a supplier may implement to create and capture value from client relationships is to dynamically adjust its scope of client services according to the emerging needs of its existing clients. While strategic management research, particularly in corporate strategy, has provided substantial insights for explaining both the antecedents and performance consequences of a firm's portfolio of businesses (Hoskisson & Hitt, 1990; Palich, Cardinal, & Miller, 2000; Ramanujam & Varadarajan, 1989; Robins & Wiersema, 1995; Wan et al., 2011), connecting corporate strategy with cooperative strategy[1] in the context of supplier-client relationships is largely absent from the literature. At the same time, while the relational view has developed considerable insights into the advantages of inter-firm coordination and exchange performance, *the implications of relationship-specific investments for horizontal business scope have yet to be examined*.

The connection between suppliers' corporate-level strategy of defining and adjusting their scope of client services, and their business-level strategy of generating competitive

[1] Cooperative strategy is the dominant perspective theorized in the relational view, and spans supplier-client relationships, as well as the various modes of strategic alliances. In this dissertation, cooperative strategy is used in the context of supplier-client relationships and is interchangeable with the relational view.

advantages from their portfolio of client relationships is particularly relevant in knowledge-based service industries. At a basic level, a broader array of client services can provide advantages for suppliers in terms of cross-selling services to clients and reducing rivalry for client business (Chatain & Zemsky, 2011; Siggelkow, 2003), while a higher volume of exchanges and the creation of multiplex ties can stabilize exchange relationships (Chatain, 2011; Rogan, 2014a). Furthermore, relationship-specific investments typically exhibit some degree of scalability and redeployability which can lower the risks and adjustment costs of supplier expansion into new lines of business (Helfat & Eisenhardt, 2004; Lucas, 1967; Sakhartov & Folta, 2014). Indeed, while holding resources and capabilities that are specific to a particular market or technology are assumed in the extant research literature to *increase* adjustment costs due to their lower alternative use value (Klein, Crawford, & Alchian, 1978), when resource investments are specialized to a particular exchange partner, then those resources (e.g., partner-specific knowledge) may be efficiently deployed across the different markets within the business portfolio of that exchange partner (Chatain & Zemsky, 2007). Therefore, relationship-specific investments can provide *inducements* (rather than barriers) for suppliers to diversify their business scope (Penrose, 1959) in line with the needs of clients with whom they share relational assets.

This dissertation advances the strategic management literature by examining both the strategies that suppliers formulate and implement to manage their portfolio of client relationships, and what the performance consequences of those strategies are. More specifically, I investigate how greater relationship-specific investments impact the horizontal business scope of suppliers, and how these investments influence two distinct measures of supplier performance - growth and survival. In knowledge-based service industries, the size of suppliers and their

ability to grow their business is a strong signal of firm strength and quality (Galanter & Palay, 1991; Maister, 1993). Such a reputation is important for client acquisition and retention (Baker, 1990; Greenwood et al., 2005) and provides advantages for attracting and motivating a professional workforce (Maister, 1993; Teece, 2003). However, the intensity of competition for clients and professional talent can make even the largest supplier vulnerable to failure, especially if they suffer a sharp decrease in revenues and/or lose key clients and employees (Harper, 2013). Thus, growth and survival are relevant performance measures for the empirical context of this dissertation. To summarize, across three empirical dissertation chapters, I address the following research questions:

> *Chapter 2: What is the effect of relational assets shared between suppliers and their clients on the long-run growth performance of suppliers?*
>
> *Chapter 3: To what extent do relational assets shared between suppliers and their clients determine the horizontal business scope of suppliers?*
>
> *Chapter 4: How does the horizontal business scope of suppliers impact their survival and what is the effect of relational assets shared between suppliers and their clients on this scope-survival relationship?*

These dissertation research questions, along with key variables and empirical models, are outlined in Table 1.1, and the connections between the empirical studies are provided in Figure 1.1.

Overview of the Empirical Studies in this Dissertation

While the relational view extols the superior value that can be created and captured from deeper relationship-specific investments, other research suggests that these investments may, in contrast, have negative impacts on value creation and value capture (i.e., relational *hazards*)

(Poppo, Zhou, & Rhu, 2008a). For example, firms in exchange relationships may fail to innovate and become inert, leading to lower productivity and revenues (Anderson & Jap, 2005), while specialized relationship investments are at a greater risk of obsolescence which reduces their value-creating potential (Balakrishnan & Wernerfelt, 1986; Uzzi, 1997). In addition, by focusing on a narrow body of clients, suppliers may increase the opportunity costs of forgone, higher-value, market opportunities (Lazzarini, Miller, & Zenger, 2008). Moreover, it is unclear from the extant research literature whether relationship advantages created at the dyad-level lead to advantages at the firm-level, or whether deeper relationship-specific investments lead, instead, to firm-level hazards. Therefore, examining the implications of relationship-specific investments across a supplier's entire portfolio of clients represents an important avenue for advancing our understanding of the performance consequences for suppliers who build strong relational ties with their clients. Thus, in chapter 2, I address this gap and extend the relational view through a portfolio-level examination of the impact of relationship-specific investments on the long-run growth performance of suppliers.

Another theoretical assumption in the relational view is that *unilateral* relationship-specific investments lead to positive relationship outcomes through higher revenues and/or lower costs (Dyer, 1997; Dyer & Singh, 1998). However, this logic is contrary to that put forth by transaction cost economics (Klein et al., 1978; Williamson, 1975), which maintains unilateral relationship-specific investments may be value *destroying* due to the increased risks of partner opportunism (which lowers the proportion of surplus profits that can be appropriated by the focal exchange partner) and higher costs of contracting over exchanges. Although the relational contracting literature (Macneil, 1980; Williamson, 1979; Zaheer & Venkatraman, 1995) maintains that exchanges involving specialized investments can be more efficiently governed

through mutually committed, cooperative exchange relationships, little attention has been given to empirically examining whether unilateral relationship-specific investments lead to positive or negative firm outcomes (Kang et al., 2009 being one notable exception) or whether mutual forms of relationship governance overcome any negative impacts of specialized investments. Accordingly, I address this theoretical tension in chapter 2 by empirically testing the impact on supplier growth performance from unilateral relationship-specific investments by suppliers and their clients, and also, the effects on supplier growth performance from mutual (i.e., joint) relationship-specific investments by these exchange partners. In chapter 2, I contribute to the relational view through a firm-level examination of whether suppliers capture performance advantages from a relational, as opposed to transactional, strategy. I also extend the relational view by revealing conditions under which relational advantages, that are theorized to exist at the level of individual relationship, aggregate to firm-level advantages. Finally, I identify conditions under which relationship-specific investments harm firm-level performance, and which run counter to the predictions of the relational view. My explicit theorizing on how relationship-specific investments impact firm *growth* performance also contributes to recent research that criticizes management research for abstract conceptualizations of firm performance and the use of empirical measures that do not sufficiently align with the underlying theoretical constructs (Miller, Washburn & Glick, 2013).

Beyond how relationship-specific investments impact the growth performance of suppliers, they may also influence the scope of services suppliers provide to clients. Although prior research has examined the antecedents of horizontal business scope (see Hoskisson & Hitt, 1990 and Wan et al., 2011 for reviews of this research), a demand-side perspective of diversification is largely absent from the literature. Indeed, the ability to draw on relational

assets could be especially relevant when the needs of clients change (Chatain, 2011; Chatain & Zemsky, 2011; Klemperer, 1992; Maister, 1993), whereby the new business opportunities materializing from changes in the scope of existing clients' outsourced work lead to suppliers changing their own business scope in response these new demand opportunities. In chapter 3, I examine how the advantages gained from deeper investments in relationships-specific assets lead suppliers to expand their business scope in response to scope changes by their existing clients. Moreover, I examine the impact on supplier diversification when clients diversify *away* from suppliers, and explain and predict how, and when, relational assets can be efficiently leveraged into new lines of business, thereby reducing the strategic risks and resource adjustment costs associated with firm expansion. Therefore, in chapter 3, I contribute to the research literatures on cooperative and corporate strategy by providing a novel explanation for horizontal diversification that is driven by vertical exchange relationships. In addition, this novel, relational theory of diversification builds explicit connections between corporate and business-level strategy. Furthermore, in contrast to prior resource-based studies of corporate diversification that posit firms are more likely to apply excess firm resources towards entering related lines of business (e.g., Penrose, 1959; Teece, 1980; 1982), I suggest suppliers can apply their under-utilized client-specific resources towards entering markets that are *less related* to their current business portfolio.

Despite the insights from prior research regarding the impacts of business scope and relationship-specific investments for, respectively, firm and relationship performance, understanding how these factors impact firm survival is relatively less clear. While extant research suggests a broader business scope may confer survival advantages for firms (Bercovitz & Mitchell, 2007), firms may be more likely to *fail* if they expand into more distant markets

(Sorenson et al., 2006) or expand too quickly (Barnett & Freeman, 2001). Similarly, the impacts of relationship-specific investments on firm survival have also been found to be inconclusive. On the one hand, the stability and endurance of committed relationships may increase firm survival (Hoetker, Swaminathan, & Mitchell, 2007; Levinthal & Fichman, 1988) and buffer firms from disruptive changes in the environment (Miner, Amburgey, & Stearns, 1990), but on the other hand, increased dependency on exchange partners can decrease a firm's outside options and can make that firm more vulnerable to failure (Lee, Mun, & Park, 2014; Singh & Mitchell, 1996). More fundamentally, however, no study has connected business scope to relationship-specific investments to explain firm survival.

I fill this research gap in chapter 4 by investigating the joint effects of business scope and relationship-specific investments on the probability of supplier survival. As a baseline, I predict greater supplier diversification increases the probability of supplier survival. Then, I examine whether suppliers can increase their survival chances when, along with holding a broader business scope, they also dedicate a greater share of organizational resources and attention to serving long-term clients with whom they are more likely to build relational assets. In addition, clients are a rich source of critical market information and a conduit for supplier learning, and I suggest that suppliers can increase their scope-survival advantages when their clients operate in relatively faster and more innovative markets. While chapter 4 primarily addresses the question of how business scope and relational assets impact supplier survival, it also tackles an important managerial dilemma by investigating the extent to which suppliers should design their organization to meet the needs of their existing clients; or to put differently, whether suppliers should formulate and implement strategies that are based on commitment or flexibility (Ghemawat & del Sol, 1998). Thus, in chapter 4, I again connect corporate-level strategy with

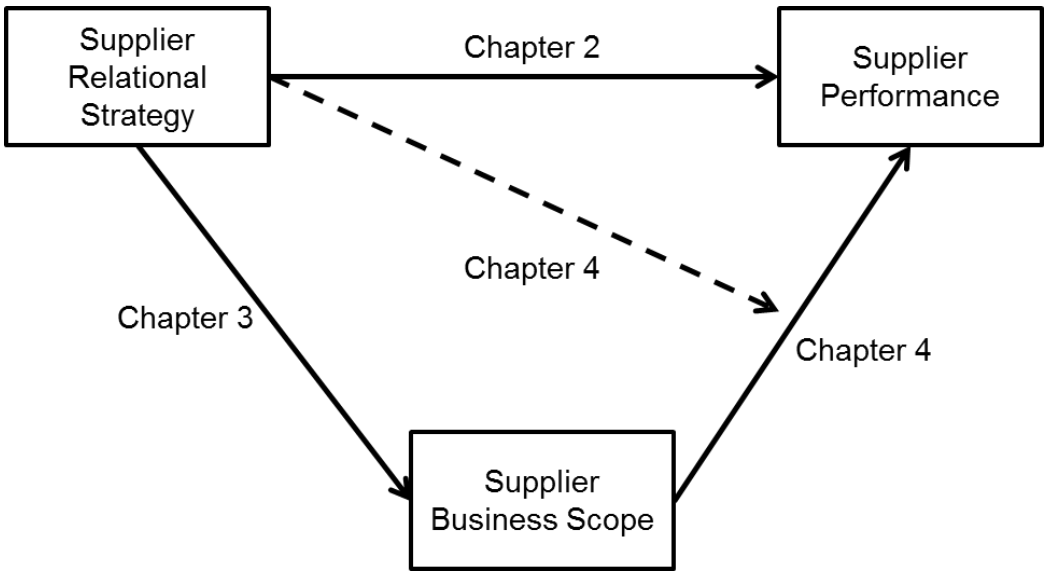
business-level strategy by revealing an important interactive relationship between a supplier's business scope and its relational strategy for firm survival. I also extend the small body of diversification research that connects business scope to organizational mortality (e.g., Barnett & Freeman, 2001; Bercovitz & Mitchell, 2007; Sorenson et al., 2006; Stern & Henderson, 2004), while contributing to recent studies which examine the value suppliers can create from providing multiple services to their clients, and how these multi-service offerings increase relationship stability (Chatain, 2011; Chatain & Zemsky, 2007).

In conclusion, this dissertation examines the impact of relational assets that are shared between suppliers and their clients, on the performance and business scope of suppliers. In contrast to the dyad-level theorizing in the relational view, across three empirical studies I advance the literature through firm-level examinations of performance, and through investigating a novel driver of firm diversification. Finally, by adopting a firm-level perspective I provide new insights into the strategic implications of being a more relational, as opposed to transactional, exchange partner.

Table 1.1: Summary of the research questions and empirical design across the three empirical chapters.

Chapter	Research Question	Dependent Variable	Independent Variables	Empirical Model
Chapter 2: Relational Advantage and the Growth Performance of Knowledge-Based Service Firms	What is the effect of relational assets shared between suppliers and their clients on the long-run growth performance of suppliers?	Five-year logged growth of attorney headcount in suppliers	1. Client-Specific Knowledge 2. Relational (client) Commitment 3. Market Growth	Ordinary Least Squares regression with Newey-West Standard Errors
Chapter 3: Relational Advantage and Partner-Driven Corporate Scope: The Case for Client-Led Diversification	To what extent do relational assets shared between suppliers and their clients determine the horizontal business scope of suppliers?	Herfindahl–Hirschman Index (HHI) of supplier patent legal work conducted across technology domains over three years	1. Client Diversification 2. Client-Specific Knowledge 3. Relational (client) Commitment 4. Relative Market Growth 5. Supplier Resource Slack	Ordinary Least Squares regression with supplier-year fixed effects
Chapter 4: Corporate Scope and the Survival of Knowledge-Based Service Firms	How does the horizontal business scope of suppliers impact their survival and what is the effect of relational assets shared between suppliers and their clients on this scope-survival relationship?	Supplier firm survival. Binary variable equal to 1 in year t if the focal supplier survival through year t+1.	1. Supplier Diversification 2. Long-term Clients 3. Client Market Opportunity	Discrete-time survival analysis

Figure 1.1: Relationships between the three dissertation empirical chapters



CHAPTER TWO

RELATIONAL ADVANTAGE AND THE GROWTH PERFORMANCE OF KNOWLEDGE-BASED SERVICE FIRMS

INTRODUCTION

The relational view (e.g., Dyer & Singh, 1998; Kale, et al., 2000) emphasizes how firms can achieve long-run performance advantages through the greater use of cooperative inter-organizational relationships (Dyer, 1996; Dyer & Chu, 2003; Madhok & Tallman, 1998; Zajac & Olsen, 1993). Theorizing in this literature maintains that investments in relationship-specific resources and capabilities and the building of reciprocal and less formal relationship governance mechanisms are important drivers of such "relational advantages" (Dyer, 1996; 1997; Dyer & Singh, 1998). Relationship-specific investments (or *relational commitments*) -- such as dedicated assets, shared routines, partner-specific knowledge, and mutual dispute resolution mechanisms -- increase value creation by improving relationship productivity, enabling contractual flexibility, and mitigating opportunistic behavior between partners (Asanuma, 1989; Dyer, 1996; 1997; Kale et al., 2000; Macneil, 1980; Williamson, 1985; Zaheer et al., 1998; Zaheer & Venkatraman, 1995; Zollo et al., 2002). Furthermore, in supplier-client relationships, relational commitments can provide advantages for suppliers in capturing new business from clients, while relationship value is preserved through greater stability and endurance of those relationships (Baker 1990; Baker et al., 1998; Chatain, 2011; Levinthal & Fichman, 1988; Moeen et al., 2013).

However, a related stream of research challenges the predictions of relational advantage within the relational view. These studies suggest that deeply embedded inter-organizational ties can decrease relationship productivity through relationship inertia (Anderson & Jap, 2005), while

relationship-specific resources and capabilities are at increased risk of obsolescence, particularly in dynamic market environments (Balakrishnan & Wernerfelt, 1986; Uzzi, 1997). In addition, firms may incur substantial opportunity costs by forgoing alternative and potentially higher-value market opportunities with new exchange partners (Lazzerini et al., 2008), as well as becoming vulnerable to the turnover of key exchange managers (Baker et al., 1998; Broschak, 2004). Thus, rather than achieve performance advantages, exchange partners may instead be exposed to the hazards inherent in deeply embedded relationships (Poppo et al., 2008a; Uzzi, 1997).

The equivocal support concerning the efficacy of relationship-specific investments for value creation suggests a theoretical tension underpinning the relational view. On the one hand, these relational commitments can increase exchange value and the volume of new business gained from existing exchange partners. On the other hand, relational commitments can constrain new relationship formation and can reduce environmental adaptability. Moreover, while this tension in the literature has mainly focused on the advantages and hazards of dyad-level relational commitments for dyadic relationship performance (e.g., Dyer, 1997; Kotabe, Martin, & Domoto, 2003), the implications for *firm*-level strategy and performance are less clear.

I seek to fill these gaps in the extant research literature by examining the impact of relational commitments on the long-run growth performance of knowledge-based service suppliers (i.e., firms who provide business services such as legal, accounting, consulting, and advertising services to corporate clients). As explained by Maister, growth is essential for knowledge-based service suppliers "in order to motivate and retain the firm's best staff. Without growth, much of the dynamism of the [firm] practice will be lost, and morale will suffer."[2]

[2] Indeed, leading US legal industry publication *National Law Journal* publishes annual rankings of the top 350 corporate law firms, where these firms are ranked by number of attorneys. It is also well understood that, in

(1993: 36). In framing this study, the distinction between theorizing at the firm-level as opposed to dyad-level is important to underscore. First, given the inertial constraints (Hannan & Freeman, 1984) many firms may face in unlocking interdependent knowledge sets and routines (Leonard-Barton, 1992; Nelson & Winter, 1982) or abandoning irreversible commitments in specialized resources (Ghemawat & del Sol, 1998), firms are unlikely to have the internal flexibility to adjust and vary their relational commitment level to different partners. Instead, rather than adjusting relational commitments at the dyad level, prior research and practitioner evidence suggests supplier firms often vary in the extent to which they adopt a more relational (embedded) versus transactional (arms-length) *firm-level* strategy (Baker, 1990; Dyer, 1997; Ghemawat & del Sol, 1998; Helper & Henderson, 2014). Second, while relational commitments may enhance the value created within the focal relationship (Dyer & Singh, 1998, Madhok & Tallman, 1998), it leaves open the question of how that value is appropriated and which exchange partner benefits the most from it (Brandenburger & Stuart, 1996). For example, although prior research has explained that some firms may make unilateral partner-specific commitments to gain inter-temporal (learning and partner-specific) advantages (Kang et al., 2009), the long run performance implications of such commitments have not been investigated. Finally, the implications of relational commitments across a firm's entire portfolio of relationships may extend beyond those captured at the dyad-level (Baker, 1990; Moeen et al., 2013; Shipilov, 2012). In particular, it is unclear whether the dyad-level relational advantages espoused by the relational view actually translate to positive firm-level outcomes. Therefore, it is valuable to understand both the firm-level advantages and drawbacks of being a more

knowledge-based industries, firm revenues and profits are closely tied to the size of the firm. In separate analyses on the largest US corporate law firms, five year growth in attorney headcount was significantly correlated with five year growth in firm revenues (r=0.84).

relational partner[3].

I theorize that suppliers investing in deeper client-specific knowledge (supplier side commitment) and suppliers who receive a greater *fraction* of their clients' new business (client side commitment) are able to grow their firm faster than suppliers who choose more arms-length relational ties. In addition, consistent with the joint value-maximizing perspective of the relational view (Dyer & Singh, 1998; Madhok & Tallman, 1998; Zajac & Olsen, 1993), I also postulate that *mutual* (i.e., joint or bilateral) relational commitments from *both* suppliers and clients provide the most favorable conditions for supplier growth. Finally, I test the limits to which relational commitments provide firm-level advantages. I maintain that in fast-growing markets, greater relational commitments *reduce* supplier growth performance. This negative impact from the market is theorized to be a consequence of greater opportunity costs through forgoing more broad-based demand growth within the business domains in which the supplier operates (Lazzerini et al., 2008) and a greater risk of knowledge obsolescence (Balakrishnan & Wernerfelt, 1986) due to limited exposure to important market advancements (Cohen & Levinthal, 1990; Uzzi & Lancaster, 2003).

I test my hypotheses in the context of outsourced knowledge-based services, which are known to suffer from higher levels of information asymmetries and partner monitoring problems (Alchian & Demsetz, 1972) and are generally difficult to explicitly contract for (Mayer & Nickerson, 2005). Consequently, value-creation in supplier-client relationships may rely to a significant degree on relationship-specific resources and capabilities and cooperative forms of

[3] The strategic aspects of firms' decisions to make relationship-specific investments and the impact of those strategies for firm outcomes have been emphasized in the research literature. For example, Ghemawat & del Sol note; "Choices concerning investment or disinvestment in resources that are more [firm] specific tend to be less reversible and should therefore be regarded as more strategic. These choices create a need to look beyond the present to the future, to think through things ahead of time. Managers should focus on such choices not only because they are difficult to make, but also because they can be counted to have a disproportionately large, long-lived impact—for better or worse—on the performance of the organization" (1998: 34).

relationship governance (Mayer et al., 2012; Moeen et al., 2013; Poppo & Zenger, 2002). My empirical tests are conducted on a longitudinal sample of patent law firms and the scope of patent prosecution services they provide to their corporate clients. The fine-grained project-level data available in this setting on outsourcing and relational strategies provide an excellent real world context in which to test my predictions.

This study makes a number of contributions to strategic management research. First, I contribute to the research literature on cooperative strategy by examining how deeply embedded inter-organizational relationships impact firm-level outcomes. While the relational view maintains a positive association between relationship-specific investments and relationship performance (e.g., Dyer, 1997; Dyer & Chu, 2003; Kotabe, et al., 2003, Krishnan, et al., 2006; Madhok & Tallman, 1998; Zaheer et al., 1998), I extend this perspective by examining how these investments affect *firm* performance. Second, I connect the relational view to resource-based theory (e.g., Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) by examining how intangible and difficult-to-imitate resources and capabilities that span organizational boundaries (as opposed to be being firm-specific) can drive firm competitive advantage (Madhok & Tallman, 1998). Finally, I respond to recent calls for management scholarship to move beyond abstract conceptualizations of firm performance and the use of empirical measures that may not align with underlying theoretical constructs (see Miller, Washburn & Glick, 2013). Accordingly, I explicitly define firm performance in terms of supplier *growth* performance and develop my theoretical premises to explain and predict how and when relationship-specific investments may positively or negatively impact this growth.

In the next sections, I present the theoretical foundations of the relational view and describe how new theoretical insights can be gained from examining the firm-level implications

of relational commitments. I then develop my hypotheses for empirical analyses.

THEORY AND HYPOTHESES

According to the relational view, specialized inter-organizational resources and capabilities can jointly generate higher relationship value for exchange partners than either partner could achieve independently (Dyer & Singh, 1998; Madhok & Tallman, 1998; Zajac & Olsen, 1993). This theoretical premise suggests, for example, that the building of idiosyncratic inter-organizational processes and routines can provide efficiencies in the communication and task coordination between exchange partners (Dosi, Nelson, & Winter, 2000; Zollo et al., 2002). In addition, greater transparency and reciprocity between exchange partners can increase the volume of tacit and proprietary knowledge exchange (Dyer & Singh, 1998; Gulati, 1995; 1998; Oxley, 1997), resulting in higher levels of inter-organizational learning (Powell, Koput, & Smith-Doerr, 1996; Uzzi & Lancaster, 2003) and the building of partner-specific expertise (Cohen & Levinthal, 1990; Hoang & Rothaermel, 2005). In turn, exchange partners may identify a greater array of synergistic combinations of inter-organizational complementary resources (Madhok & Tallman, 1998), manage partner-specific interdependencies with increasing effectiveness (Milgrom & Roberts, 1995; Moeen et al., 2013), and in supplier-client relationships, produce customized products and services that more precisely meet the needs of clients (Chatain, 2011; Priem, 2007).

However, although building specialized inter-organizational resources and capabilities may increase exchange value within the focal relationship, those investments are typically less applicable outside of the focal setting (Argyres & Liebeskind, 1999; Subramani & Venkatraman, 2003; Williamson, 1975). Lower alternative use value for specialized resources can weaken a

firm's bargaining power in an exchange, exposing that firm to potential opportunistic behavior by the other exchange partner (Klein et al., 1978; Williamson, 1975). On the other hand, while these exchange hazards may, all else equal, dissuade firms from making deeper relational commitments, when longer-term *joint* relationship value outweighs the short-term gains from acting opportunistically, the incentivizes of exchange partners are said to be aligned (i.e., a mutual desire to preserve relationship value) and, therefore, behavioral uncertainty is reduced (Axelrod, 1984; Baker, Gibbons, & Murphy, 2002; Macneil, 1980; Vanneste & Frank, 2013; Zajac & Olsen, 1993).

Allied to this forward looking perspective, the development of shared cooperative norms that promote the health of the relationship, and reinforce the belief that the other exchange partner will not act opportunistically, can also be the consequence of a positive exchange history between suppliers and clients (Gulati, 1995; Heide & Miner, 1992; Macneil, 1980; Madhok, 1995; Poppo et al., 2008a; Ring & van de Ven, 1994; Vanneste, Puranam, & Kretschmer, 2013; Williamson, 1985; Zaheer et al., 1998). As a result, formal contracting over exchange relationships (Williamson, 1975) may be complemented (or substituted) by more relational forms of contracting that are undergirded not by complex legal prescriptions, but by goodwill, trust, and embedded cooperative norms (Corts & Singh, 2004; Gulati & Nickerson, 2008; Hoetker, 2005; Macaulay, 1963; Macneil, 1980; Poppo & Zenger, 2002).

Yet, despite the broad appeal for building relational advantages in supplier-client relationships, the imperfect transferability of relationship-specific resources and capabilities (Ghemawat & del Sol, 1998; Klein et al., 1978; Williamson, 1985) and penalties that may be imposed by clients on suppliers for breaching cooperative norms (Axelrod, 1984; Rogan, 2014b), may restrict the opportunities for suppliers to gain new clients. These market constraints can lead

to suppliers becoming over-dependent on a narrow body of existing clients (Baker, 1990; Sorenson & Waguespack, 2006), which can, again, expose suppliers to the hazards inherent in embedded relationships (Baker, 1990; Uzzi, 1997).

While the theorizing thus far has evolved in the literature mainly through dyad-level research examinations, the implications for firm-level outcomes from dyadic commitments are palpable. For example, while the value created from specialized dyadic investments may also increase firm-level performance, the drawbacks to dyadic commitments may also manifest at the firm-level and detrimentally impact the longer-term competitiveness of firms. Certainly, if all relationships are valuable opportunities for firms, then focusing on an individual relationship (i.e., at the dyad-level) can neglect examining the antecedents and consequences of a firm's entire *portfolio of relationships,* and the implications of how dyadic advantages translate to the firm-level (Baker, 1990; Shipilov, 2012).

Building from prior literature in the relational view, the present study examines the firm-level performance implications for suppliers who share greater relational commitments with their clients. Both scholars and practitioners alike suggest that creating value through inter-organizational relational commitments are likely to be a firm-level strategy: For example, Ghemawat & del Sol note that firms often encounter a strategic tension between commitment and flexibility: "companies must frequently *choose between commitment to competing in a particular way and the flexibility to compete effectively in a variety of ways*" (1998: 26 emphasis added). This sentiment is echoed in the following comment by a corporate law firm executive: "It's not just about going to the client and talking about pricing…what we try to instill into the client is the understanding that we are willing to be true partners"[4]. Therefore, in this study I

[4] Quote obtained from panel discussion with law firm executives hosted by Practising Law Institute. Reproduced with permission.

seek to generate new insights regarding the value of relational commitments for *firm* performance by considering the firm-level implications of relational commitments as outcomes of a *relational strategy*. A relational strategy is conceptualized as the building and use of relationship-specific resources and capabilities and mutual forms of relationship governance to support longer-term economic commitments with exchange partners.

Client-Specific Knowledge

Prior studies reveal that new outsourced client projects are valuable new business opportunities for knowledge-based service suppliers (Maister, 1993; Mayer et al., 2012) and the effective competition for this new business is often reduced to a small pool of suppliers who have made commitments to gain a deeper understanding of their clients' business (Chatain, 2011; Coates et al., 201; Moeen et al., 2013). This "client-specific knowledge" may reside as the skills, knowledge, and experience of exchange managers (e.g., lawyers or advertising agents who manage client projects and interact directly with client stakeholders) that are specific to meeting the needs of the client (Anderson & Schmittlein, 1984; Williamson, 1985), and may be complemented by firm-level client-specific resources and capabilities that are necessary for executing client projects, such as specialized knowledge-transfer routines and building unique bundles of complementary inter-organizational assets (Zollo et al., 2002).

In knowledge-based service industries, many suppliers compete through non-price forms of rivalry, such as market status, reputation, and service quality (Baker et al., 1998; Chatain, 2011; Han, 1994; Levinthal & Fichman, 1988). Greater investments in client-specific knowledge may support a broader market differentiation strategy of suppliers (Porter, 1980) by providing a significant source of added-value to clients in service delivery (Brandenburger &

Stuart, 1996; Chatain, 2011) and increase total value creation in the relationship (Zajac & Olsen, 1993). Moreover, market frictions such as learning about new business opportunities, screening alternatives, and communication costs are reduced when working with existing clients (relative to other potential clients) to develop new business. It is therefore not surprising that suppliers are often advised to be especially attentive to the array of new business opportunities available from existing clients (Maister, 1993).

In addition to supplier-side advantages (Chatain, 2011; Moeen et al., 2013), clients can gain from learning about supplier capabilities and behavioral patterns which can be then leveraged into future transactions with that supplier (Argyres & Zenger, 2012; Mayer et al., 2012). Indeed, the following quote from an executive of a client firm emphasizes the value clients place on suppliers learning about their business:

> "We are looking for [legal suppliers] who are really willing themselves *to show that they are willing and capable to invest in the relationship*…The switching costs of using another [law] firm exist"[5].

I suggest suppliers can achieve long-run growth performance advantages through making deeper investments in the businesses of their clients. First, relative to all possible supplier options for a client, the number of suppliers holding deep levels of client-specific knowledge is likely to be small (Chatain, 2011). Suppliers who make such knowledge investments therefore have advantages in capturing greater volumes of future business from those clients (Chatain, 2011; Levinthal & Fichman, 1988; Mayer et al., 2012). Second, suppliers can utilize client-specific knowledge to provide customized client services, increasing their "added-value" (Brandenburger & Stuart, 1996) and in turn, the upper bound on a client's willingness to pay (Priem, 2007).

[5] Quote from panel discussion of corporate executives hosted by Practising Law Institute. Reproduced with permission

Indeed, the decision to invest in client-specific knowledge may be an ex-ante strategic decision (Kang et al., 2009) in order to reduce rivalry for client new business and to capture a greater share of relationship value (Brandenburger & Stuart, 2007; MacDonald & Ryall, 2004). Third, although client-specific knowledge investments are irreversible commitments (Ghemawat & del Sol, 1998), when viewed across multiple transactions, suppliers can generate both scope and scale economies through the dissemination and re-use of this knowledge, thereby lowering the overall costs of service provision (Chatain & Zemsky, 2007; Krugman, 1980). I therefore present the following hypothesis:

H1: The greater the client-specific knowledge of a supplier, the higher the growth performance of that supplier.

Relational (client) Commitment

Clients often prefer to use an existing supplier when they have a new outsourced knowledge-based project rather than use a new supplier (Chatain, 2011; Mayer et al., 2012). This outsourcing strategy decreases the costs of searching for and vetting new suppliers, while information spillovers across repeated economic exchanges (Argyres & Liebeskind, 1999) ease the challenges for clients in determining both the true quality of supplier capabilities (Akerlof, 1970; Barzel, 1982) and the level of productive effort applied by suppliers in service delivery (Alchian & Demsetz, 1972).

While repeated exchanges are clearly important for building relationship-specific resources and capabilities (Argyres & Liebeskind, 1999; Macneil, 1980), clients can also signal greater relational commitment by providing suppliers with a larger *fraction* of their outsourced work (Axelrod, 1984; Schelling, 1960). Although clients may lose strategic flexibility by

increasing its reliance on a single supplier (Moeen et al., 2013), clients are also conveying positive expectations of relationship continuity and cooperative behavior. Indeed, practitioners suggest that cooperative behavior and developing close inter-organizational ties are important strategic choices for some firms in the pursuit of value creation. For example, take the following comment from an executive of client firm Du Pont:

> "[Law] Firms felt a greater commitment to Du Pont when they were entrusted with our entire [intellectual property] business in their country or region. In many, the senior leadership on their own initiative undertook a study of Du Pont's business and demonstrated an eagerness to adapt their practices to meet our needs. We were gratified by the tremendous enthusiasm and commitment displayed by the selected firms. Our work now received much needed management attention and closer professional focus" (Dull & Gould, 2002).

Importantly, this "preferential status" enables suppliers to capture a greater share of clients' premium, high value, and strategically important work (Wilkins, 2009). By undertaking a greater share of these important client projects, suppliers have greater (client-specific) learning opportunities that allow them to more effectively manage interdependencies across client projects (Milgrom & Roberts, 1995) while also providing greater opportunities to build individual-level relationships that encourage the transfer of important tacit knowledge. Moreover, mutual expectations for positive relationship conduct can stimulate deeper relationship-specific investments that increase relationship longevity and the flow of clients' new business to the supplier (Bercovitz, Jap, & Nickerson, 2006; Larson, 1992; Macneil, 1980; McEvily & Marcus, 2005; Uzzi, 1997).

Taken together, I suggest that greater relational commitment from a supplier's portfolio

of client's increases supplier growth performance as the signal of cooperative behavior provides the necessary economic safeguards that suppliers may require before making investments to grow the firm. In addition, capturing a greater share of client's work allows suppliers to more effectively manage and coordinate client projects (Milgrom & Roberts, 1995), freeing up resources that can, again, be applied towards growing the firm (Penrose, 1959). Thus, I offer the following hypothesis:

H2: The greater the level of relational commitment a supplier receives from its portfolio of clients, the higher the growth performance of that supplier.

Mutual Commitment

The relational view, which draws from, and is complemented by, the relational contracting literature (e.g., Macaulay, 1963; Macneil, 1980; Telser, 1980; Vanneste & Frank, 2014), maintains that exchange partners are incentivized to behave cooperatively when the longer-term joint gains from relationship-specific investments are greater than the potential short-term individual gains exchange partners can generate by acting in self-interest (Dyer & Singh, 1998; Heide & Miner, 1992; Telser, 1980; Zajac & Olsen, 1993). Joint relationship investments are often associated with the development of greater levels of cooperative norms (Bercovitz, et al., 2006; Williamson, 1979) that incentivize deeper relationship-specific investments, (Williamson, 1983), and in turn, create higher relationship value (Zajac & Olsen, 1993). Although *unilateral* relational commitments can place one exchange partner in an inferior bargaining position relative to the other partner (Williamson, 1985), *mutual* relational commitments are bilateral relationship-specific investments made by both partners under the expectations of fairness and ongoing cooperative behavior.

Moreover, it has been long established in the research literature that the creation of joint value may be an important strategic concern for firms who recognize that accommodating the interests of the other exchange partner can lead to mutually beneficial outcomes (Schelling, 1960). Indeed, commitments to joint value creation may form an integral part of a broader relational strategy, as the following anecdotal evidence from a law firm executive suggests;

> "Both the client and the firm look for ways to strengthen the partnering relationship by generating mutual benefits which provide additional incentives to achieve the best possible results. As a result, clients have recognized that, by focusing more work in fewer firms, they can achieve better results"[6].

The insight from the above quote is tantalizing as it suggests clients can *induce* suppliers to make greater relationship-specific investments (for example, in deeper levels of client-specific knowledge) by committing to provide those suppliers with greater share of their outsourced (and premium) work over the longer term (Moeen et al., 2013; Wilkins, 2009). Thus, relational (client) commitment provides a credible safeguard on the future value of supplier investments, therefore incentivizing suppliers to make deeper, irreversible relational commitments that have the potential to create the highest value (Dyer & Singh, 1998). However, clients may only be willing to make greater relational commitments to suppliers should they also have expectations that those suppliers will reciprocate. In effect, both suppliers and clients must provide credible signals of mutual commitment that safeguard relationship-specific investments; suppliers through formulating and implementing a relational strategy and investing in their clients' business, and client's through the promise of a greater share of its outsourced work and commitment to cooperation.

[6] Quote taken from an interview with Robert Hays, managing partner of a leading US corporate law firm. Interview with Robert Hays. The Metropolitan Corporate Counsel, 14(2): February 2006.

One important outcome of mutual relational commitments is the development of greater levels of cooperative relational norms that enable more effective relationship governance (Macneil, 1980; Ouchi, 1980; Williamson, 1979). These norms galvanize partners such that exchange contracts become concerned less with stipulating and enforcing the legal rights and obligations of partners (although these are still important), and more concerned with defining the obligations for cooperative behavior and establishing expectations for relationship conduct -- in other words, relational contracting (Macaulay, 1963; Macneil, 1980; Telser, 1980; Zaheer & Venkatraman, 1995). Through relational contracting, exchange relationships are governed through informal and mutually accommodating governance mechanisms that rely to a greater extent on the goodwill, trust, and flexibility of exchange partners (Macneil, 1980). Prior research studies show that relational contracting can be a highly efficient means of governing relationships by lowering transaction-costs and mitigating contractual hazards (e.g., opportunism) even when relationship-specific resources and capabilities are important drivers of exchange value (Dyer, 1997; Williamson, 1979).

In sum, mutual relational commitments provide safeguards for both the supplier and clients when making relationship-specific investments. Suppliers benefit from capturing a greater share of their clients' outsourced work, but the relational commitments provided by clients and the mutual development of cooperative norms also mitigate the potential hazards of investments in client-specific knowledge. Suppliers, thus, have incentives to invest in building knowledge and capabilities that deliver the highest levels of value through being able to precisely meet the needs of clients. Mutual commitment, therefore, provides the greatest level of economic bonding, placing the supplier in a strong position to capture significant volumes of new business from existing clients over the longer term, which leads to the following hypothesis:

H3: The greater the client-specific knowledge of a supplier, the stronger the positive association between relational (client) commitment and the growth performance of that supplier.

Market Growth

Fast-paced, rapidly growing markets provide favorable conditions for suppliers to capture greater volumes of outsourced demand across a broader range of clients, which in turn, confers advantages for growing their business. Compared to markets where the level of outsourced client demand is relatively stable over time, higher growth markets are characterized by year-on-year increases in the level of demand that allow suppliers to leverage scalable resources and to extend firm capacity by bringing in new talent (Levinthal & Wu, 2010; Sakhartov & Folta, 2014).

However, strategies for extracting value in higher growth markets -- which necessitates suppliers to be responsive to frequent changes in the knowledge requirements of those markets (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997; Winter, 2003) -- are likely to compete with strategies for capturing value from embedded client relationships. (Ghemawat & del Sol, 1998). For example, the former strategy typically leads suppliers to gain, and continually update, specialized expertise in an industry and/or profession in order to serve a broader range of clients (Mayer et al., 2012). However, suppliers implementing the latter strategy are likely to find their strategic flexibility compromised due to a narrower knowledge-base and holding resources and capabilities that are more specialized to the needs of embedded clients rather than the market (Anderson & Jap, 2005; Argyres & Liebeskind, 1999; Leonard-Barton, 1992; Subramani & Venkatraman, 2003; Williamson, 1985). Moreover, these suppliers

are likely to face greater barriers in updating their knowledge base in line with the requirements of the market. In knowledge-based services, interacting with a broader array of clients is a considerable driver of supplier learning (Coates et al., 2011; Uzzi & Lancaster, 2003) and suppliers who focus on maintaining deeply embedded client relationships are at an increased risk of knowledge obsolescence and reduced market competitiveness over the longer term (Anderson & Jap, 2005; Balakrishnan & Wernerfelt, 1986).

One factor that may influence a supplier's tendency towards embedded client relationships is uncertainty regarding both the conduct and the level of value that can be appropriated from exchanges with new clients. This uncertainty is higher at the inception of the relationship (Barzel, 1982; Hölmstrom, 1979) and arguably has a stronger impact on a supplier's decision to form new relationships in growing markets as the needs of clients change with greater frequency (Moeen et al., 2013). In these conditions, exchange contracts are likely to require frequent renegotiation or remain largely incomplete, opening the possibility of opportunism by clients. In contrast, suppliers following a relational strategy have greater safeguards on opportunistic behavior and may (perhaps myopically) prefer continue to direct organizational resources towards deepening those relationships, even if this results in the neglecting of alternative and potentially higher-value market opportunities with new clients (Lazzarini et al., 2008; Sorenson & Waguespack, 2006). However, the opportunity costs (for supplier growth) from forgoing new clients are likely to be greater in higher-growth markets; not only are suppliers failing to take advantage of favorable conditions for growing their firm, but by relinquishing potential new clients to rival suppliers they are also providing greater opportunities for those rivals to gain capability advantages *and* increase their market share.

In sum, rather than supporting a supplier's value proposition, relational commitments in

high growth markets can *reduce* a supplier's ability to attract new business. In such contexts, clients may place high value on a supplier's exposure and responsiveness to cutting-edge market knowledge which they can access an incorporate into their business (Coates et al., 2011; Mayer et al., 2012). Not surprisingly, prior research findings show that in these markets, clients may prefer more transactional, arms-length ties with suppliers in order to retain strategic flexibility and reduce the costs of switching between suppliers as their needs change (Moeen et al., 2013). Effectively, for a supplier following a relational strategy, the ex-ante large numbers competitive market is "fundamentally transformed" and the supplier's "market" reduces from large to small numbers (Sorenson & Waguespack, 2006; Williamson, 1985), limiting the number of new clients the supplier is able to capture (Chatain & Zemsky, 2011). I therefore predict that greater relational commitments in higher growth markets to have a significant negative impact on supplier growth performance, and accordingly, I present the following pair of hypotheses:

H4a: The greater the growth of the markets within a supplier's portfolio, the weaker the positive association between client-specific knowledge and supplier growth performance.

H4b: The greater the growth of the markets within a supplier's portfolio, the weaker the positive association between relational (client) commitment and supplier growth performance.

SAMPLE AND METHODS

Sample

I tested my hypotheses using a longitudinal panel dataset on relationships between patent law firms (suppliers) and their corporate clients. The primary data source used to identify the law

firm sample was the official patent attorney roster of registered patent attorneys published by the Office of Enrollment and Discipline (OED) of the US Patent and Trademark Office (USPTO). Before being allowed to practice patent law, patent attorneys are required to register before the US patent bar, after which they are included on the OED roster. The OED roster details the name, employer and unique registration code for each registered patent attorney, and is continually updated to include newly registered patent attorneys and to reflect mobility of patent attorneys between employers. Thus, for any point in time it is possible to identify the number of patent attorneys employed by suppliers. My supplier sample consists of 126 patent law firms who in 1990 had at least five patent attorneys and who were present throughout the entire observation period in order to allow detailed empirical tracking.

I investigated relationships between patent law firms and client firms using data on outsourced patent prosecution work. Patent prosecution is the process of writing, filing, and managing the legal and administrative requirements with the USPTO until the patent is granted (which, on average, is approximately three years from filing the patent with the USPTO). Client firms may undertake patent prosecution work in-house or outsource it to a patent law firm. In essence, the prosecution of each patent is a narrowly defined project whereby an outsourced patent represents a transaction between the client and supplier. To create my sample of outsourced patents, I obtained all utility patents filed (and subsequently granted) to the USPTO during the period from 1988 to 1995. Each patent application identifies the client, law firm (or name of in-house patent attorney) who prosecuted the patent, and the specific technological classification of the patented invention. To identify those patents outsourced to my sample of patent law firms, I used multiple search algorithms on each law firm name to search in the "Attorney or Agent" field on the patent application. Using the detailed information within patent

applications, for each year I created fine-grained patent portfolios for each supplier and client firm, and then used these portfolios to construct detailed transactional histories between each patent law firm and their clients. Including prior years used to build variables and accounting for lagging independent variables by five years in the primary analyses (see below), I identified a core sample of approximately 192,000 patents outsourced by roughly 27,000 clients to my sample of 126 suppliers.

Dependent Variable

Supplier Growth Performance: The interest in this study resides in examining the growth in patent attorneys for each patent law firm across five-year intervals. I measured *Supplier Growth Performance* as the five-year log-difference[7] in the number of patent attorneys employed by each patent law firm. Log-difference models are standard practice for measuring growth (e.g., Chen, Williams, & Agarwal, 2012; Coad & Teruel, 2013; Geroski, 1995; Podolny, Stuart, & Hannan, 1996) and are good approximation for capturing the relative percentage growth rate. In addition, difference-models remove unobserved firm-specific variation across time periods, thus allaying concerns of potential measurement error (Allison, 1990; Henderson & Fredrickson, 2001; Mishina, Pollock, & Porac, 2004).

Independent Variables

Client-Specific Knowledge: Following prior research, I used patent backward self-citations as a measure of client-specific knowledge (Moeen et al., 2013; Wang & Chen, 2010; Wang, He, & Mahoney, 2009). Backward patent citations identify the body of prior knowledge that the focal patent builds on. A backward *self*-citation is an instance where a client's patent

[7] log(S(t) – S(t-1) / S(t-1)) = log(S(t)) – log(S(t-1)), where S is size. See Coad (2009) for derivation.

cites a patent that belongs to the same client, and indicates the accumulation of firm-specific knowledge (Wang et al., 2009). To prosecute an outsourced patent with backward self-citations, a law firm must hold detailed knowledge of the technological background of the patent which includes knowledge of the clients' prior cited technologies (Moeen et al., 2013). When a supplier's patent portfolio contains a greater proportion of backward self-citations (to all citations) this indicates that the patent work performed by the supplier requires greater levels of client-specific knowledge. To compute *Client-Specific Knowledge*, over the prior three years I calculated the average percentage of backward citations to all citations in the law firm's patent prosecution work.

Relational (client) Commitment: For each client in each year in my sample, I obtained their number of outsourced patents and calculated the three-year percentage of those patents to each of the suppliers in my sample. A higher fraction of client work outsourced to a particular supplier is an indication that the client has made a greater relational commitment to that supplier (Moeen et al., 2013). However, a supplier's attention and resource allocation may be heterogeneously distributed among clients, even if the share of work received from those clients is similar. Estimates could be biased if I did not correct for clients who may be more important to a supplier. Accordingly, I weighted the share of client work outsourced to the focal supplier by the fraction of that supplier's total business accounted for by each client in the previous three years. I then aggregated across clients to compute a weighted portfolio-level measure of *Relational (client) Commitment* for each supplier in each year.

Market Growth: Using the universe of utility patents (i.e., outsourced patents and those completed in-house by clients) between 1988 and 1995, I computed the growth of each technological industry domain (where industry domains are measured by four-digit International Patent Class (IPC)) by calculating a rolling three-year log-difference growth-rate in the number of patents in each four-digit IPC (Moeen et al., 2013). I then calculated a supplier-specific market growth measure by weighting the log-growth of each IPC within the supplier's business portfolio by the fraction of that supplier's patents in those IPCs (over the prior three years). *Market Growth* is thus a weighted average measure of growth in markets within a supplier's portfolio, where the weights reflect the relevance of supplier expertise in each industry (IPC) domain (Mayer et al., 2012).

Controls

In my models, I also included a number of firm-level controls that may impact supplier growth performance. *Client Dynamism* is the growth in patenting from existing clients within a suppliers portfolio, with more dynamic clients providing greater new business opportunities for suppliers. To compute this measure, I calculated three year log-difference growth-rate in patents outsourced by clients and aggregated across the clients in a supplier's portfolio, weighting each client by the three-year fraction of work they account for in the focal suppliers' portfolio. *Outsourced Percentage* is the rolling three-year percentage of patents outsourced by each client (as a fraction of total patents for each client) in a supplier's portfolio, weighted by the three-year fraction of that suppliers' total business accounted for by each of those clients. I then aggregated across all clients within the suppliers' portfolio. The extent of outsourcing (relative to patent work completed internally by the client) may influence a client's outsourcing strategy (Mayer et

al., 2013; Moeen et al., 2013). *Outsourced Volume* is the number of patents outsourced by each client to a focal supplier, which, again, is weighted by the three-year fraction of that suppliers' total business accounted for by those clients before aggregating across all clients in the supplier's portfolio. *Supplier Size* is computed as the number of patent attorneys employed by a supplier in the prior period (and is the base year of the growth model) and mitigates bias toward smaller firms who may grow faster than larger firms (Coad et al., 2014; Hall, 1987; Schreyer, 2000). *Supplier Turnover* is calculated as the number of attorney exits from each supplier in the prior three years divided by the average number of supplier attorneys for the same prior three years, and controls for the effect of employee mobility which has been shown to impact the productivity of supplier-client relationships (Broschak, 2004; Somaya, Williamson, & Lorinkova, 2008). *Supplier Scope* is measured as a Herfindahl index (HHI) computed from the share of supplier patents in each 4-digit IPC, corrected for bias in HHI measures associated with patent counts at lower numbers (Hall, 2002). *Domain Expertise* is measured as the three-year share of non-prior art citations (such as citations to academic publications and research presentations) among all citations in a supplier's patent portfolio. A higher share of non-prior art citations is an indication that a supplier builds more on specialized scientific knowledge relative to practical inventions (Cassiman, Veugelers, & Zuniga, 2008; Squicciarini, Dernis, & Criscuolo, 2013). *Occupational Expertise* is calculated as the percentage of patents in the supplier's prior patent work that cite a previously litigated patent. Such patents are themselves about six times more likely to be subject to litigation than an average patent, and clients are likely to seek superior occupational expertise to prosecute these patents in case they are later contested in the courts (Mayer et al., 2012). All independent and control variables are log-transformed to linearize the econometric model and to allow coefficients to be interpreted in terms of elasticity.

Econometric Model

This study is concerned with measuring growth performance in patent law firms, where the interest resides in examining differences between firms, rather than changes within the same firm (e.g., comparing the effect of one firm following a more relational strategy than another). The data were organized in dynamic cross-sectional panels and I used a pooled cross-section time series model with lagged independent variables to test my hypotheses. The temporal properties of pooled cross-section models can make these models susceptible to heteroskedasicity and serial correlation in the residuals when estimating using Ordinary Least Squares (OLS) (Beck & Katz, 1995). A significant Breusch-Pagan (1979) test statistic indicated the presence of heteroskedasicity, while a Cumby-Huizinga (1992) test indicated potential serial correlation in the residuals over the prior three years to the observation year. If uncorrected, the standard errors could be biased and report false levels of statistical significance. Accordingly, I employed a Newey-West standard error correction (Newey & West, 1987) in my estimates which adjusts the standard errors for both heteroskedasicity and potential non-independence in the distribution of residuals due to serial correlation (Greene, 2003). An alternative to OLS with Newey-West standard errors is a Feasible Generalized Least Squares (FGLS) model with autocorrelation correction, which uses an estimate of the error process for the autocorrelation correction. However, in time-series cross-sectional models, the estimated coefficients from FGLS will not necessarily have the optimal properties of OLS (Gujarati, 2003) because the error process has a large number of parameters which can cause standard errors to understate their true variability (Beck & Katz, 1995). Finally, in the primary analyses that estimated five-year supplier growth performance, all independent and control variables were lagged by five years.

RESULTS

Tables 2.1 and 2.2 report the summary statistics and correlation matrix respectively. I calculated variance inflation factors (VIF) for the independent and control variables. A VIF below 10 indicates that multicollinearity does not influence results (Welsch, 1982). The mean VIF for all variables was 1.68, and the highest VIF for a single variable was 2.79.

Table 2.3 presents results from the main OLS model with Newey-West standard errors in which Model 1 includes the control variables only. For the control variables, it is notable that, with the exception of Model 2, *Market Growth* has a positive and statistically significant impact on supplier growth performance, however *Client-Dynamism* has no statistically significant impact on supplier growth performance. Model 2 reports the result for hypothesis 1, which posited suppliers holding greater levels of C*lient-Specific Knowledge* have higher growth performance. The coefficient on the variable is not statistically significant, thus in Model 2, H1 is not supported. Model 3 tests hypothesis 2 which predicted a greater level of relationship commitment from a supplier's clients has a positive impact on supplier growth performance. The coefficient on *Relational (client) Commitment* is positive and significant at the 1% level, strongly supporting H2, and indicating that suppliers who capture a greater fraction of outsourced work from their clients are able to grow more rapidly. Hypothesis 3 posited that *Mutual Commitment* has a positive effect on supplier growth performance. Model 4 reports this result. The positive and significant coefficient at the 5% level offers robust support for H3.

Figure 2.1 illuminates the effect of *Mutual Commitment* on supplier growth performance. We observe suppliers who receive higher levels of relational commitment from clients have the greatest opportunity for growth when they also hold higher levels of client-specific knowledge. However, when relational (client) commitment is low, greater client-specific knowledge has a

constraining effect on supplier growth performance which is the opposite of the prediction of H1. Finally, it is important to underscore that the negative and significant coefficients on *Client-Specific Knowledge* and *Relational (client) Commitment* in Model 4 should be interpreted as the residual effect on these coefficients when the interaction term (H3) is zero. However, this does not occur in my data. Thus, readers should refer to Figure 2.1 for an interpretation of these main effects rather than interpreting the coefficients as true negative slopes.

Model 5 provides the result for hypothesis 4a, which posited *Market Growth* to have a negative effect on supplier growth performance when *Client-Specific Knowledge* is higher. The coefficient on the variable is negative and significant at the 5% level, thus supporting H4a. Figure 2.2 interprets H4a graphically, and comparison of the slopes provides strong evidence for the constraining effect of client-specific knowledge on supplier growth performance. We observe clearly that in higher growth markets, suppliers accumulating greater levels of client-specific knowledge realize lower growth performance. We notice also that in stable markets, client-specific knowledge actually has a negligible effect on supplier growth performance; although overall growth performance is also lower in these more stable markets

Model 6 reports hypothesis 4b, which similar to H4a, predicted *Market Growth* to have a negative effect on supplier growth performance when the level of *Relational (client) Commitment* from a supplier's client portfolio is higher. The coefficient on H4b is negative and significant at the 1% level, offering strong support for this hypothesis. Figure 2.3 provides graphical representation of H4b. Comparing slopes, we see that as relational (client) commitment increases, suppliers who operate in higher growth markets suffer a growth penalty. However, we also observe that when suppliers compete in more stable markets an increase in relational commitment from clients provides substantial growth *advantages*. Finally, Model 7

includes all variables. Comparing the models and figures together, with the exception of H1 the empirical findings corroborate most of this study's predictions.

Additional Analyses

A number of additional analyses were undertaken to test the robustness of the primary results, and are presented in Appendix A. First, to address concerns that relationship-specific investments only impact supplier growth performance over a specific time horizon, analyses were also conducted over four-year and three-year growth intervals. These results were consistent with the main empirical findings presented in Table 3, although levels of statistical significance became weaker as the time intervals decreased, suggesting that relationship-specific investments have a greater impact on long-run rather than short-run growth performance. Second, alternative supplier growth specifications were tested. I calculated a conventional (i.e., non-logged) relative growth-rate model that measured the five year percentage change in attorney headcount from the initial size in t-5. I also calculated the Compound Annual Growth Rate (CAGR) in number of attorneys. CAGR is a metric commonly used in finance to measure growth of investment returns. Finally, I computed supplier growth performance using a DHS Index (Davis, Haltiwanger, & Schuh, 1996) that calculates supplier growth performance relative to the average of the initial and final attorney headcount. The DHS Index counters concerns that initial size may not be a reliable indicator of a firm's actual size, and which may produce abnormally high or low growth rates (Coad, 2009; Friedman, 1992). Again, results from these alternative dependent variable specifications confirm the main predictions in this study, ruling out concerns that the primary findings are an artefact of the log-difference growth measure.

While this study measured market growth in terms of the three-year logged growth-rate

in the number of *patents* in each four-digit IPC, I also used an alternative measure by calculating the three-year logged growth-rate in the number of *clients* in each IPC, which similarly represents broad-based new business opportunities for suppliers. The results were almost identical, corroborating H4a and H4b (the statistical correlation between market growth in patents and market growth in clients is approximately 0.9). Finally, I conducted analyses using robust standard errors clustered by firm as opposed to Newey-West standards errors and, again, the results hold. Taken together, the confirmatory robustness tests provide confidence in the empirical findings and variable specifications used in the present study.

Limitations

This study does, however, suffer from several limitations. The first limitation concerns the generalizability of results. While patent legal services are archetypal of knowledge-based services, and thus the theorizing and findings in this study are likely to be broadly applicable across other knowledge-based services contexts (e.g., accounting, management consulting) and possibly other types of knowledge-intensive industries (e.g., IT software consulting, healthcare), they may be less applicable to contexts in which *physical* assets are important drivers of value. For example, substantial sunk-cost investments in specialized tooling or manufacturing facilities may bring a different set of strategic concerns and incentives for managers of those firms compared to managers of firms whose strategic assets are human capital and client relationships. However, despite the potential limitations in generalizability, the context of patent legal services is an excellent laboratory for studies of relational strategies due to the detailed, project-level data available for outsourced patent work which enable the construction of fine-grained transaction histories and relational portfolios between suppliers and clients.

The second, related, limitation concerns the scope of observed client relationships. This study is a single industry setting, i.e., patent legal services; however some firms in my sample may also offer legal services beyond this context and thus have greater opportunities to build relational assets with clients. Although data on the scope of legal services offered by my sample of law firms were not available, I was able to identify which of my sample firms were include in the annual National Law Journal (NLJ) rankings of the top 250 US corporate law firms ("NLJ 250"), which are typically broad-based firms offering an array of legal services[8]. In additional analyses (see Appendix A), I created a dummy variable equaling 1 if the firm was an NLJ 250 firm and included this variable in re-running the main empirical models. The coefficient on NLJ 250 was positive and significant across all models at either the 5% or 10% level, and importantly, the coefficients on the hypotheses were consistent with the main findings of this study.

Finally, it is possible that clients provide a greater share of outsourced demand to suppliers with a superior market reputation and therefore it is the suppliers' reputation for quality rather level of relational commitments *per se* that drive supplier growth performance. Firm reputation is unobservable in my dataset and may therefore constitute a source of endogeneity. However, concerns of supplier growth performance being driven by this unobserved factor are reduced through three factors. First, the dummy variable NLJ 250 discussed above can also be interpreted as a control for firm quality and reputation. Second, the control variables of domain expertise and occupational expertise are measures of superior industry (domain) or professional (occupational) capabilities. As shown in Table 3, these control variables are not statistically

[8] Two firms in my sample, Fish & Neave and Fish & Richardson, are specialized intellectual property law firms and consistently featured in the NLJ 250.

significant. Furthermore, in unreported results, domain expertise and occupational expertise were interacted with both client-specific knowledge and relational (client) commitment, and again the coefficients were not statistically significant. Third, superior quality firms should realize growth advantages in higher growth markets, even if their client relationships were characterized by deeper relational commitments. Yet, as the results of H4a and H4b suggest, in these markets patent law firms suffer a growth penalty when they share deeper relational commitments with clients. Therefore, while not being able to control specifically for firm reputation, I believe the reported results and additional analyses alleviate this data limitation.

DISCUSSION

Drawing from the relational view, in this study I investigated how relationship-specific investments (or *relational commitments*), impacted the growth performance of knowledge-based service suppliers. The empirical setting for this study was patent legal services, and I utilized the detailed information contained within outsourced patents to construct fine-grained relational portfolios between patent law firms and their portfolio of clients. In contrast to many studies in the relational view that are focused at the dyad-level, the current study adopted a firm-level perspective that accounted for all client relationships within a supplier's portfolio. Therefore, one contribution of this study is to the nascent literature which examines the firm-level outcomes of greater relational commitments in supplier-client relationships (e.g., Baker, 1990, Moeen et al., 2013). Furthermore, by examining relationship-based drivers of supplier growth performance, which naturally considers the effects of information spillovers across repeated transactions between the same exchange partners, this study informs the growing body of research that examines the outcomes of repeated transactions within *dyadic* buyer-supplier

relationships (e.g., Kang et al., 2009). Another theoretical contribution of this study is to connect the relational view with resource-based theory (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). For example, the logic of isolating mechanisms (Rumelt, 1984) extoled by resource-based theory to hold firm-specific resources in place and protect firm performance advantages from being eroded by rival firms, can also be applied to the intangible and difficult to replicate co-specialized *inter-organizational* resources and capabilities examined in this study.

The theorizing in this study builds on the prior insight that suppliers are often favorably placed to capture new business from their existing clients, which in turn provides greater opportunities to build relational advantages (Chatain, 2011; Maister, 1993, Mayer et al., 2012; Moeen et al., 2013). However, the present study is also informed by literature that uncovers a possible "dark side" to embedded inter-organizational relationships (e.g., Anderson & Jap, 2005; Lee, 2013; Poppo et al., 2008b; Uzzi, 1997). This literature reveals the potential tradeoffs for firms who build embedded ties, such as increased partner switching costs (leading to persistence bias in relationships), and a greater risk of knowledge obsolescence. Bringing these opposing perspectives together into a single theoretical framework, this study contributes to the relational view by providing a more nuanced investigation of the performance implications for suppliers who make greater relational commitments to their clients through implemented a relational strategy.

The relational view emphasizes partner-specific knowledge as key driver of relationship value creation (Dyer & Singh, 1998). However, while specialized knowledge investments may improve relationship productivity (e.g., Dyer 1997; Kotabe et al., 2003), the redeployment of specialized knowledge to alternative contexts is typically associated with a loss in productive value (Klein et al., 1978; Williamson 1985). Consequently, greater value creation from using

specialized knowledge for its intended purpose is likely to increase the persistence bias of existing exchange relationships. The unexpected finding in this study that higher levels of client-specific knowledge may *constrain* supplier growth performance (Hypothesis 1, see Figure 2.1) is an indication of the tradeoffs inherent in building relationship-specific resources and capabilities. Indeed, while the relational view proposes suppliers can achieve greater value from client-specific knowledge investments, transaction cost economics (1985; 1996) maintains that unilateral relationship-specific investments without *ex ante* economic safeguards are hazardous due to asymmetric *ex post* bargaining power and the constraining attributes of specialized resources (Klein et al., 1978). Although, Kang et al., (2009) found that far-sighted suppliers may be willing to make unilateral relationship-specific investments in order to gain longer term payoffs in terms of learning, capability development, and strategic positioning, their study is, nonetheless, at the dyad level. When considered across a portfolio of relationships, the hazards and constraints associated with a portfolio of specialized resources may be greater than the potential relationship advantages extoled by the relational view. Thus, I extend literature in the relational view by highlighting an important firm-level consequence of making unilateral relationship-specific investments.

Drawing from the theoretical premise that credible signals of relationship commitment from clients can lead to performance advantages for suppliers, I found empirical support for the prediction that supplier growth performance is higher when clients provide suppliers with a greater fraction of their outsourced work (Hypothesis 2). While gaining a greater volume of new business from clients provides favorable conditions for relational assets to build, capturing a greater *fraction* of a clients' new business indicates that the client is strongly committed to cooperative behavior and relationship longevity, which, in turn, provides incentives for a

supplier to make deeper relationship-specific investments. This finding also suggests suppliers derive substantial value from existing clients when those relationships can be governed through more informal, and self-enforcing, mechanisms (Macneil, 1980; Poppo et al., 2008a; Telser, 1980). Moreover, the control variable *Outsourced Volume* was not statistically significant indicating that simply gaining more outsourced work from clients is not sufficient to drive firm performance[9]. Thus, one important contribution of this finding is to the relational governance (and relational contracting) literature by showing that informal mechanisms of relationship governance not only provide advantages within the focal relationship, but aggregated across many clients, relational governance can also deliver positive firm-level performance outcomes.

Although the findings in this study suggest that the direct effects of relational (client) commitment and client-specific knowledge have opposing impacts on supplier growth performance, these relational mechanisms may actually be concomitant and mutually reinforcing for value creation (Bercovitz et al., 2006; Dyer & Singh, 1998; Zajac & Olsen, 1993). The finding in this study that mutual (or joint) relational commitment from suppliers and clients maximizes supplier growth performance (Hypothesis 3) corroborates this line of theorizing. Thus, I extend the relational view by empirically revealing the firm-level advantages that can be achieved when both exchange partners are jointly committed to the health of the relationship.

The current study also investigated the impact of market conditions on supplier growth

[9] The distinction between volume of work and fraction of work is important to underscore. Clients may choose to outsource a larger volume of more routine, less complex work to suppliers who can generate economies of scale (Krugman, 1980). By performing greater quantities of similar work across many clients, supplier can pass on this discount by charging clients a lower fee for the services than it would cost clients to complete the work themselves. Thus, a client's decision to outsource larger volumes of work to a supplier is akin to "make versus buy" logic of transaction cost economics, where not only is it less costly for a client to contract with an external firm to perform the requisite work (Williamson, 1975), but also clients may differentiate between suppliers based on price. Here, relationship-specific resources and capabilities may develop as an organic process through information spillovers across repeated transactions, rather than through any deliberate or strategic relational commitments, which is indicated through shifting a greater share of outsourced work to a smaller number of suppliers (Moeen et al., 2013).

performance. In higher growth markets, broader-based demand growth provides greater opportunities for suppliers to capture greater volumes of new business and, in turn, opportunities to grow their firm. However, the ability of suppliers to exploit these markets by maintaining resource flexibility and building generalizable resources and capabilities arguably competes with strategies of suppliers for creating value from specific resource investments and stable client relationships. Furthermore, prior literature reveals that when markets advance rapidly in their underlying knowledge requirements, *clients*, on average, prefer weaker ties with suppliers in order to maintain flexibility in sourcing new suppliers with requisite capabilities (Moeen et al., 2013). My findings support this theoretical premise by showing that when the markets within a supplier's business portfolio grow more rapidly, greater client-specific knowledge investments by suppliers (Hypothesis 4a) and greater relational commitment from clients (Hypothesis 4b) significantly lowers supplier growth performance. This result is in contrast to the positive and significant direct effect of market growth on supplier growth. I therefore extend the relational view by revealing prevailing market conditions have important implications for the efficacy of relationship-specific investments for value creation.

The empirical findings in this study offer a number of interesting future research opportunities. First, by adopting a firm-level perspective of relational advantage and examining the performance hazards from relationship-specific investments, future research should further investigate the consequences of formulating and implementing relational strategies within inter-organizational relationships. For example, the assumption in this study is that suppliers may find their ability to capture new business constrained by the switching costs associated with redeploying specialized resources to other clients. However, the willingness of suppliers to invest deeply in a client's business may provide those suppliers an important avenue for market

differentiation, resulting in a greater ability to capture new clients who themselves are searching for suppliers who could perform the role of "strategic partner". Second, future research should look beyond the specific empirical context of supplier-client relationships in outsourced patent legal services. Other types of knowledge-based services, such as accounting or management consulting, may rely less on relational advantages, or may be bound by industry regulations in terms of relationship longevity. Thus, future research may investigate the extent to which suppliers are willing to make relationship-specific investments when relationships have an enforced duration, and examine the implications for supplier outcomes from making specific investments under such conditions. Third, the effect of relative standing differences between suppliers and clients is another opportunity for future research. For example, are suppliers more likely to realize advantages or hazards by making relationship-specific investments with clients who have a higher or lower relative standing? On the one hand, building strong ties with clients of superior standing may increase the reputation of the supplier and enable it to gain further high-caliber clients. On the other hand, suppliers may find themselves at a power disadvantage with clients and thus become over-exposed to relational hazards, such as opportunism from dominant clients (Baker, 1990). Untangling these effects would provide nuanced insight into the dynamics of supplier-client relationships. Finally, this study used firm growth as a measure of performance. An alternative approach could be to investigate the effect of relationship-specific investments on firm survival, which is also a viable performance measure.

In conclusion, I believe that the research findings in the current study make important contributions to the strategic management field by highlighting that the strategies which deliver advantages at the level of dyad do not necessarily translate up to firm-level, and additionally, that market factors have an important bearing on the efficacy of relationship-specific investments for

value creation. I encourage researchers to use this study as a platform when investigating the antecedents and consequences of embedded inter-organizational relationships.

TABLES AND FIGURES

Table 2.1: Summary statistics of key variables

Variables	Mean	S.D.	Min	Max	Between S.D.	Within S.D.
Supplier Growth Performance	0.20	0.38	-2.08	1.77	0.33	0.19
Client-Specific Knowledge	0.10	0.04	0.02	0.25	0.03	0.02
Relational (client) Commitment	0.55	0.14	0.01	0.98	0.12	0.08
Market Growth	0.22	0.11	-0.02	0.62	0.08	0.07
Client Dynamism	0.40	0.90	-3.36	3.64	0.51	0.75
Outsourced Percentage	0.71	0.15	0.04	1.00	0.13	0.08
Outsourced Volume (to focal supplier)	68.95	146.35	0.95	1157.13	141.83	36.06
Supplier Size	26.13	27.30	1.00	189.00	26.93	5.31
Turnover	0.05	0.08	0.00	0.86	0.06	0.05
Supplier Scope	0.04	0.03	0.01	0.24	0.03	0.02
Domain Expertise	0.13	0.08	0.02	0.63	0.08	0.02
Occupational Expertise	0.02	0.01	0.00	0.06	0.01	0.00

Table 2.2: Correlations between variables

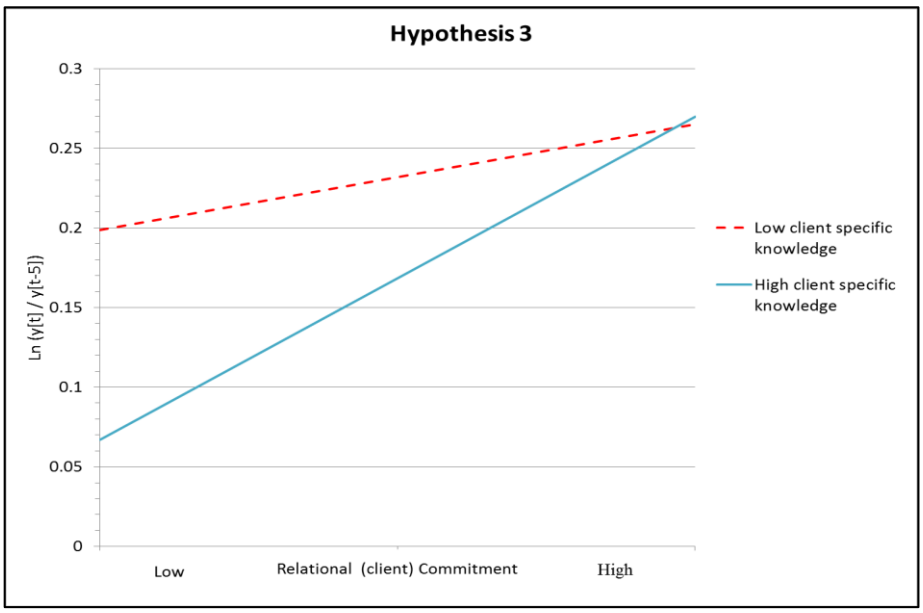
	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	Supplier Growth Performance	1											
2	Client-Specific Knowledge	0.00	1										
3	Relational (client) Commitment	0.10	0.17	1									
4	Market Growth	0.22	-0.05	0.02	1								
5	Client Dynamism	0.11	-0.10	0.12	0.25	1							
6	Outsourced Percentage	0.07	0.15	0.29	0.06	0.06	1						
7	Outsourced Volume (to focal supplier)	0.03	0.32	0.19	0.31	0.00	0.16	1					
8	Supplier Size	0.35	0.13	0.02	0.26	-0.06	-0.12	0.17	1				
9	Turnover	-0.04	0.02	-0.15	0.16	0.01	0.01	0.06	0.02	1			
10	Supplier Scope	-0.01	0.00	0.14	0.21	0.08	0.10	0.30	-0.11	-0.06	1		
11	Domain Expertise	0.16	0.07	-0.01	0.26	0.00	-0.10	-0.04	0.22	0.03	0.28	1	
12	Occupational Expertise	0.20	-0.18	-0.01	0.32	0.19	-0.04	-0.16	0.19	0.01	0.11	0.14	1

Table 2.3: Determinants of supplier growth performance (logged) over five years

Logged Variables		1	2	3	4	5	6	7
Client-Specific Knowledge	H1		-0.0806		-1.786**	0.0920		-1.484**
			(0.0582)		(0.732)	(0.0967)		(0.703)
Relational (client) Commitment	H2			0.268***	-0.731*		0.775***	-0.159
				(0.0887)	(0.398)		(0.198)	(0.400)
Client-Specific Knowledge *Relational (client) Commitment (*Mutual Commitment*)	H3				0.423**			0.380**
					(0.174)			(0.164)
Market Growth * Client-Specific Knowledge	H4a					-1.161**		-0.874*
						(0.554)		(0.511)
Market Growth * Relational (client) Commitment	H4b						-3.093***	-2.879***
							(0.991)	(0.948)
Market Growth		0.848*	0.722	0.919*	0.794*	3.379**	13.46***	14.47***
		(0.489)	(0.456)	(0.475)	(0.448)	(1.350)	(4.151)	(4.119)
Client Dynamism		-0.00567	-0.00566	-0.00574	-0.00480	-0.00596	-0.00534	-0.00475
		(0.00430)	(0.00431)	(0.00419)	(0.00411)	(0.00428)	(0.00402)	(0.00394)
Outsourced Percentage		2.761*	2.884*	1.939	1.980	2.830*	1.914	1.921
		(1.480)	(1.481)	(1.367)	(1.287)	(1.476)	(1.274)	(1.201)
Outsourced Volume (to focal supplier)		-0.00890	0.00395	-0.0187	-0.00403	0.00730	-0.0219	-0.00493
		(0.0241)	(0.0256)	(0.0242)	(0.0254)	(0.0252)	(0.0235)	(0.0247)
Supplier Size		0.0461	0.0489	0.0471	0.0541	0.0519	0.0513	0.0598*
		(0.0362)	(0.0362)	(0.0350)	(0.0347)	(0.0359)	(0.0346)	(0.0345)
Turnover		0.0225	0.0221	0.0290	0.0265	0.0193	0.0307	0.0262
		(0.0239)	(0.0238)	(0.0234)	(0.0231)	(0.0237)	(0.0231)	(0.0228)
Supplier Scope		-0.0328	-0.0348	-0.0496	-0.0531	-0.0452	-0.0482	-0.0595
		(0.0426)	(0.0421)	(0.0429)	(0.0395)	(0.0415)	(0.0413)	(0.0378)
Domain Expertise		0.0393	0.0431	0.0529	0.0573	0.0474	0.0489	0.0568
		(0.0422)	(0.0415)	(0.0393)	(0.0385)	(0.0415)	(0.0383)	(0.0381)
Occupational Expertise		0.0658	0.0702	0.0356	0.0481	0.0718	0.0422	0.0545
		(0.0885)	(0.0865)	(0.0867)	(0.0834)	(0.0863)	(0.0791)	(0.0769)
Constant		-2.779*	-2.727*	-3.025**	1.110	-3.074**	-5.068***	-1.461
		(1.433)	(1.395)	(1.390)	(1.751)	(1.429)	(1.619)	(1.925)
Year Dummies		Y	Y	Y	Y	Y	Y	Y
Robust Standard Errors		Y	Y	Y	Y	Y	Y	Y
R-Squared		0.099	0.105	0.127	0.146	0.112	0.149	0.171
Number of Suppliers		126	126	126	126	126	126	126
Observations		750	750	750	750	750	750	750

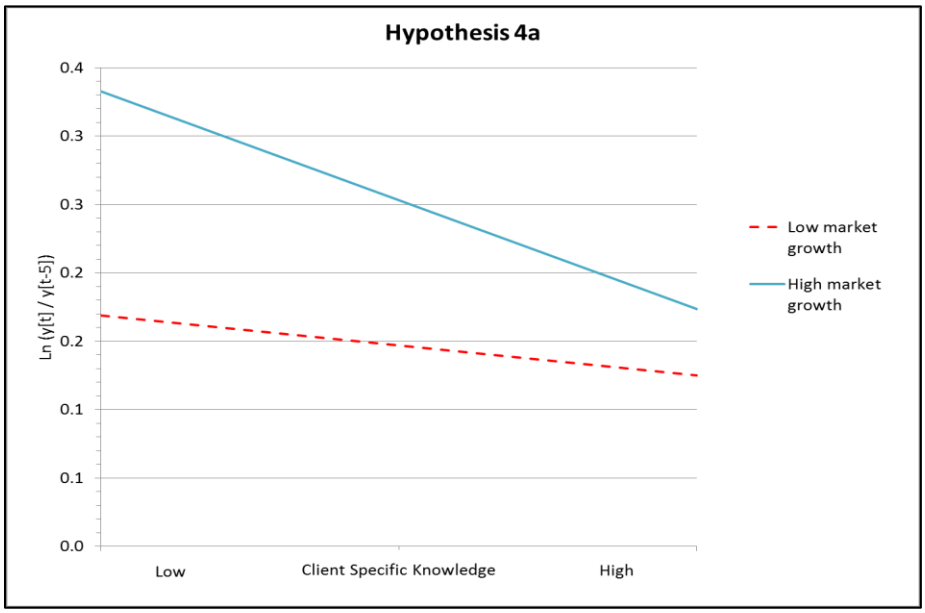
Notes: Ordinary Least Squares model with Newey-West standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Figure 2.1: Mutual Commitment: Interaction effect of client-specific knowledge and relational (client) commitment on supplier growth performance



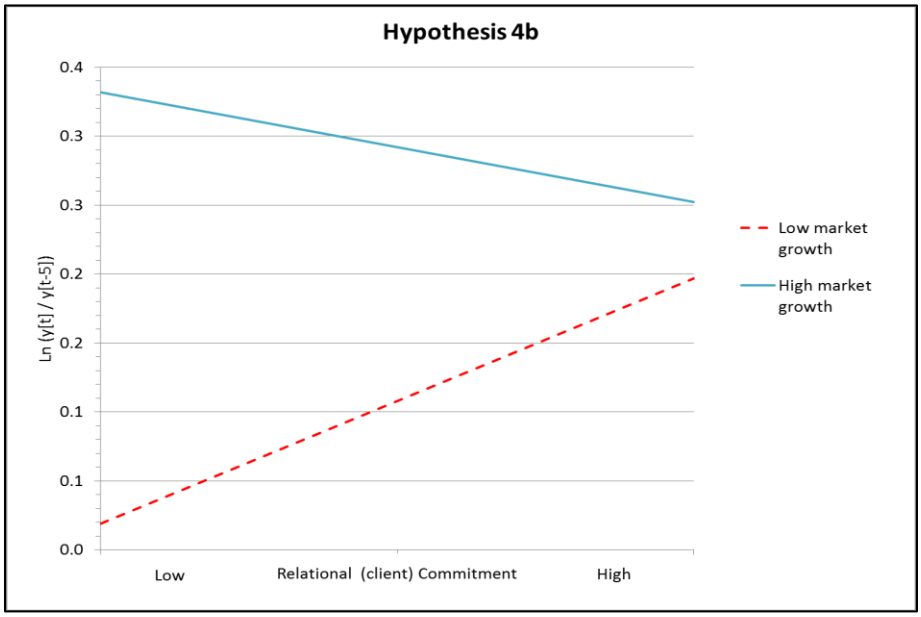
Note: High and low values are one standard deviation above and below the mean, respectively.

Figure 2.2: Interaction effect of market growth and client-specific knowledge on supplier growth performance



Note: High and low values are one standard deviation above and below the mean, respectively.

Figure 2.3: Interaction effect of market growth and relational (client) commitment on supplier growth performance



Note: High and low values are one standard deviation above and below the mean, respectively.

CHAPTER THREE

RELATIONAL ADVANTAGE AND PARTNER-DRIVEN CORPORATE SCOPE: THE CASE FOR CLIENT-LED DIVERSIFICATION

INTRODUCTION

The relational view (e.g., Dyer & Singh, 1998; Kale, et al., 2000) has its foundations in the value that can be created when exchange partners jointly make investments in building relationship-specific resources, capabilities and dispute resolution mechanisms, which collectively represent the partners' shared relational capital (Dyer & Singh, 1998; Madhok & Tallman, 1998; Williamson, 1985; Zajac & Olsen, 1993). Investments in relational capital – such as dedicated assets, inter-firm routines, and relational governance mechanisms – can enhance the productivity of exchange relationships while also managing the risks of opportunistic behavior between exchange partners (Asanuma, 1989; Dyer, 1996; Dyer & Singh, 1998; Kale et al., 2000; Uzzi, 1997; Williamson, 1985; Zaheer, et al., 1998; Zollo, Reuer, & Singh, 2002). Not surprisingly, relational capital has been shown to have significant advantages in managing buyer-supplier relationships, resulting in improved transactional performance, longevity of relationships, and ability to capture new business (e.g., Baker, et al., 1998; Chatain, 2011; Gulati & Nickerson, 2008; Hoetker, 2005).

While the relational view has developed considerable insights into the advantages of relational capital for inter-firm coordination and exchange performance, the implications of relational advantage for corporate scope – specifically the horizontal scope of partner firms – remain largely unexplored. However, the opportunities for investigating this question are palpable, both in prior research and managerial practice. For example, research studies reveal

that buyers often prefer to select an existing supplier when they have a new outsourced need (Chatain, 2011; Mayer et al., 2012), which can potentially draw suppliers into new lines of outsourced business. Additionally, research suggests that the buyer's choice of supplier for an individual product may be influenced by the opportunity to buy multiple products from the same supplier, especially when inter-dependencies or complementarities exist between those outsourced needs (Milgrom & Roberts, 1995; Moeen et al., 2013; Novak & Stern, 2009; Parmigiani & Mitchell, 2009) or when buyers can economize on the transaction costs of managing many suppliers (Klemperer, 1992). A broader horizontal scope may also enable firms to build stronger, multiplex ties with buyers by cross-selling multiple products or services to them (Rogan, 2014a; Siggelkow, 2003). Anecdotally, managers in supplier firms also report pressures from existing buyers to diversify in order to meet the increasingly diverse needs of the buyers. For example, in October 2002, when intellectual property law firm Lee, Mann, Smith, McWilliams, Sweeney & Ohlson (Lee Mann) diversified by merging with the full service law firm Barnes & Thornburg LLP, Dennis M. McWilliams, a key partner in Lee Mann, noted that his firm had "been successful as an intellectual property firm, but we are finding with greater frequency that our clients are requiring a broader range of legal services than we can provide."[10]

While it has long been recognized that diversification derives from unique non-contractible resources of the firm (e.g., Farjoun, 1994; Miller, 2004; Montgomery & Hariharan, 1991; Robins & Wiersema, 1995; Silverman, 1999; Teece, 1980; 1982), recent scholarship has highlighted the need for these resources to be scalable (Levinthal & Wu, 2010) or redeployable (Sakhartov & Folta, 2014) in order to support diversification. Many relational assets exhibit some degree of scalability (e.g., bilateral trust and reputation) or redeployability (e.g. partner-specific knowledge built during prior projects), and they can therefore be a viable foundation for

[10] See: http://www.insideindianabusiness.com/newsitem.asp?id=2964 (accessed 07/22/2014).

firm diversification. However, relational assets are uniquely constrained in the uses to which they are fungible or synergistic (Levinthal & Wu, 2010; Sakhartov & Folta, 2014) – specifically, they only have value in business activity with a specific partner, and thus their ability to support diversification is partner-specific. Therefore, a theory of corporate scope based on relational advantage must ultimately be built on a partner-driven rationale.

Drawing on prior research that suggests that buyer-supplier relationships can become self-perpetuating due to information impactedness, relational experience and *ex post* small numbers relationships (Chatain, 2011; Mayer et al., 2012; Williamson, 1975; 1985), I develop and test a relational theory of changes in the horizontal scope of supplier firms that is driven by the changing scope of their buyers (i.e., clients[11]), which I label "client-led diversification." Building on this baseline prediction, I develop hypotheses positing that this client-led diversification effect is stronger when a supplier has invested in greater levels of client-specific knowledge, and when clients provide higher levels of relational commitment with the supplier. Both partner-specific knowledge investments and credible relational commitment are forms of relational capital, which may be viewed as (partially) scalable and redeployable resource inputs that generate scope economies across a range of services provided to the same client (Chatain, 2011; Chatain & Zemsky, 2007). Finally, I examine two additional conditions which may stimulate client-led diversification. First, the markets of clients may offer greater opportunities for growth and profitability than a supplier's current markets, thus providing incentives for suppliers to respond to client diversification. Second, the ability of suppliers to generate excess resources can deliver cost and resource-based advantages if applied to diversification (Montgomery & Hariharan, 1991; Penrose, 1959; Teece, 1982).

[11] "Buyers" and "Clients" are used interchangeably throughout this study.

I test my propositions in the context of outsourced knowledge-based services, which are generally difficult to explicitly contract for and may therefore rely to a significant degree on relationship-specific investments and relational capital (Mayer & Nickerson, 2005; Moeen et al., 2013; Poppo & Zenger, 2002). Because these types of services – and knowledge-impacted outsourcing in general – are growing rapidly and representing an increasing share of the economy, I expect my relational theory of firm diversification and empirical work to have significant value for future research. My empirical tests are conducted on a longitudinal sample of patent law firms and the scope of patent prosecution services they provide (measured across diverse industry domains) for their corporate clients. Due to the detailed project-level data available in this setting on outsourcing, relational assets, and firm diversification, it provides a useful real world laboratory in which to test my predictions.

My research seeks to make a number of contributions to strategic management scholarship by bridging the research literatures on cooperative strategy and corporate strategy, and moreover, connecting corporate-level strategy with business-level strategy. First, I contribute to the cooperative strategy literature by building on the well-understood implications of the relational view for dyadic relationship performance (e.g., Dyer, 1997; Dyer & Chu, 2003; Kotabe et al., 2003, Krishnan et al., 2006; Madhok & Tallman, 1998; Zaheer et al., 1998), and extend these insights to develop and test a theory about how relational capital impacts firm-level corporate scope. Second, I advance the corporate strategy literature by highlighting a hitherto unexplored rationale for diversification. One of the dominant perspectives in the corporate diversification literature is that firms diversify to capture production-related synergies from sharing scalable resources across lines of business or from redeploying under-utilized resources from one business line to another (e.g., Chatterjee & Wernerfelt, 1991; Levinthal & Wu, 2010;

Penrose, 1959; Sakhartov & Folta, 2014; Teece, 1982). I offer the perspective that – by a similar logic – relational capital is a (buyer and supplier) firm-specific resource that may also be leveraged into new lines of business and lead to diversification; however, because this resource is also partner-specific, the supplier's diversification is in turn related to client diversification. Finally, by exploring the limits of client-led diversification outcomes, I also contribute to the emerging literatures on demand-side strategy (e.g., Adner & Zemsky, 2006), and value creation in buyer-supplier relationships (e.g., Chatain, 2011; Chatain & Zemsky, 2007).

THEORY & HYPOTHESES

The theoretical foundations of the relational view are grounded in the premise that a firm's critical resources may be substantially embedded within inter-organizational relationships (Dyer & Singh, 1998). Relationship-specific resources and relational governance can improve exchange performance and increase the likelihood of future transactions between those exchange partners (Baker, 1990; Baker et al., 1998; Chatain, 2011; Gulati & Nickerson, 2008; Hoetker, 2005; Mayer et al., 2012; Moeen et al., 2013). While transaction cost economics argues that specific investments may increase the risk of partner opportunism and costs of contracting over exchanges (Williamson, 1985), the relational view maintains that these investments are important for realizing relational value (Dyer & Singh, 1998; Zajac & Olsen, 1993) and that the attendant risks and costs can be mitigated through relational governance (Dyer, 1997; Kale et al., 2000; Poppo & Zenger, 2002; Ring & van de Ven, 1994; Williamson, 1979; Zaheer et al., 1998). Critically, relational governance reduces exchange hazards through embedded norms of trust and cooperation, which enable contractual adaptation and management of partner conflict (Gulati, 1995; Macneil, 1980; Uzzi, 1997; Vanneste & Frank, 2013; Vanneste, et al., 2014); while the

longer-term perspective on value creation incentivizes the further development of these governance mechanisms and increases relational commitment (Dyer, 1997; Dyer & Chu, 2003).

The ability to draw on relational advantages may be especially relevant when the needs of clients change. To service clients' new needs, suppliers can leverage shared relational assets and relational governance, and draw on internal stocks of relationship-specific capabilities such as detailed knowledge of the client's business and client-specific routines. Supplier advantages in acquiring new business from existing clients are enhanced in the context of knowledge-intensive outsourcing, as in the case of knowledge-based services (e.g., law firms, accounting firms, and management consultancies). These types of transactions are strongly impacted by multiple sources of market frictions such as demand uncertainty, weak performance measurement, information asymmetry, and appropriation hazards (Mayer & Nickerson, 2005; Mayer & Salomon, 2006; Moeen et al., 2013). In such contexts, working with existing suppliers may give client firms a modicum of control over the risks and hazards presented by outsourcing. Therefore, the new outsourcing needs of a client become valuable opportunities for its existing suppliers as they typically enjoy a significant advantage in capturing this business (Chatain, 2011; Chatain & Zemsky, 2011; Coates et al., 2011).

Client Diversification

I begin my theorizing by noting the important role that a supplier's *existing* clients may play in inducing the supplier to diversify. Transaction cost economics suggests that prior outsourcing often engenders a "fundamental transformation" by which the buyer and supplier are cast into a small numbers relationship, which fosters continued transactions between them (Williamson, 1975; 1985). For example, prior outsourcing typically leads to partner-specific

information exchange that has value for future transactions, leading to an "information impacted" relationship (Williamson, 1975). The ability to draw on knowledge about an existing client's idiosyncratic technologies, priorities, and strategic interdependencies can reduce information asymmetries and learning costs that may otherwise be incurred when undertaking a knowledge-based project for a new client (Chatain & Zemsky, 2007; Ethiraj et al., 2005). The relational view suggests that the client also gains from learning about supplier capabilities, organization and behavioral patterns, which can be leveraged into future transactions with the supplier.

Moreover, even ordinary market frictions such as learning about new business opportunities, screening alternatives, and communication costs are reduced when working with existing clients (relative to other potential clients) to develop new business. The relational view also emphasizes the importance of exchange managers in creating and sustaining inter-firm relationships (Carnahan & Somaya, 2013; Kale et al., 2000), and exchange managers' relational capabilities can play a valuable role in helping suppliers find and manage new business with existing clients (Burt, 1992; Granovetter, 1985; Mayer & Argyres, 2004). Thus, consistent with extant diversification theory, which suggests that firms can gain economic synergies by sharing complementary resources across multiple lines of business (Panzar & Wilig, 1981; Sakhartov & Folta, 2014; Teece, 1982), suppliers can benefit from previously developed relationship-specific advantages by "cross-selling" a variety of outsourced work to clients (Chatain, 2011; Chatain & Zemsky, 2007).

Not surprisingly, knowledge-based service firms are often advised to leverage existing client relationships instead of sourcing new clients, as the latter can involve significant client development and mutual learning costs (Maister, 1993; Wilkins, 2009). Prior studies have also

shown that clients prefer to use an existing supplier when outsourcing work in a new area (e.g., Chatain, 2011). Moreover, if suppliers don't respond to the new needs of existing clients, rival suppliers may have an opportunity to poach those clients over the long run (Bower, 2014) by establishing a new relationship and/or increasing their added value with the client (Brandenburger & Stuart, 1996; Chatain, 2011; Seabright et al., 1992). Therefore, new business opportunities materializing from changes in the scope of existing clients' outsourced work can be an important demand-pull factor that leads suppliers to change their own business scope. Thus, the diversification of clients' outsourced work across a supplier's portfolio of clients can provide a significant impetus for changes in supplier scope. Accordingly, I propose the following:

H1. Greater diversification in the outsourcing needs of a supplier's existing clients will be associated with greater supplier diversification.

Client-Specific Knowledge

Idiosyncratic, partner-specific knowledge is proposed in the relational view as a critical component of joint value creation (Dyer & Singh, 1998). For a supplier, detailed knowledge about a client's business creates efficiencies in learning and problem solving (Zollo, et al., 2002), and enables the supplier to effectively identify client needs, coordinate interdependencies across projects and more precisely customize services for the client (Chatain, 2011; Chatain & Zemsky, 2007; Ethiraj et al., 2005; Wang et al., 2009). For example, within the empirical context of this study (legal services), commentators have frequently noted how law firms establish dedicated client teams that develop and use deep knowledge about the client's business (Wilkins, 2009), which is often cited by clients as fundamental to a successful relationship.[12]

[12] The following comments from corporate counsels, who hire law firms for their companies, emphasize the point: "Understand the business. This can't be overstated. …the best [attorneys] do it thoroughly to come up with results

When clients derive strategic value from suppliers holding client-specific knowledge, the potential pool of suitable suppliers available to clients may be greatly reduced (Chatain, 2011; Rosen, 2002). Lacking the client-specific knowledge that is often gained from prior outsourced work undertaken for that client, new suppliers face more limited opportunities to understand the client's business or to develop relationships with its outsourcing managers. Effectively, rivalry for the client's new business reduces to small numbers competition (Chatain & Zemsky, 2011; Moeen, et al., 2013; Williamson, 1985) and the resulting shift in competitive forces favors suppliers who have client-specific knowledge (Chatain, 2011). Prior empirical research has also established that when suppliers hold greater levels of client-specific knowledge, exchange relationships with those clients are more likely to be expanded and persist (Chatain, 2011; Levinthal & Fichman, 1988; Mayer et al., 2012; Moeen et al., 2013).

The persistence of client-supplier relationships is not only due to the potential for creating higher value from client-specific knowledge. Suppliers are also inherently limited in their ability to apply specific knowledge relating to one client to other clients' outsourced work (Williamson, 1985). By definition, relationship-specific resources cannot be redeployed outside the focal relationship without incurring a significant loss in the productive value of such resources (Argyres & Liebeskind, 1999; Klein et al., 1978; Subramani & Venkatraman, 2003; Williamson, 1985). Once these specific knowledge investments are made, the ex-ante large numbers competitive market is "fundamentally transformed" into an ex-post bilateral monopoly (Williamson, 1985) and relationships may persist due to the supplier switching costs associated

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oriented and cost effective solutions that are consistent with core values of the company. And doing that is a key to a successful, long-term relationship with me." "Take time to truly learn the client's business so you understand what their needs are … [and] think strategically."
http://www.wickerparkgroup.com/ClientBestPractices/ClientBestPractices.aspx (accessed May 21, 2014).

with developing similar specific knowledge with other clients. Moreover, uncertainty about the potential value that may be generated in alternative client relationships may produce a persistence bias (Lazzarini et al., 2008), which is likely to be higher when suppliers hold higher client-specific knowledge.

Resource-based explanations for corporate scope maintain that diversification stems from scalable or slack firm-specific resources with alternative uses that cannot otherwise be accessed through the market (Levinthal & Wu, 2010; Panzar & Willig, 1981; Penrose, 1959; Sakhartov & Folta, 2014; Teece, 1982). In knowledge-intensive industries, diversification is more likely to be driven by firms' *human capital* resources, which can be redeployed (or scaled) into related areas where these resources are also valuable (Farjoun, 1994). However, when the knowledge resources held by the firm's human capital is client-specific, diversification that is enabled by these resources will also be client-specific and is therefore likely to be driven by diversification in clients' outsourced needs. In particular, if clients diversify into areas that are new to the supplier, the supplier may diversify into these areas to leverage the client-specific knowledge resources held by its human capital.

In sum, suppliers have an advantage in capturing new business from their existing clients, and in adding value to this work, when they hold client-specific knowledge (Chatain, 2011; Mayer et al., 2012; Moeen et al., 2013). Even if the new business is in areas outside the current business scope of the supplier, it represents a significant opportunity to grow revenues and add value to clients, which is ultimately beneficial for the supplier's long run performance. Moreover, the limited redeployability of client-specific knowledge investments means that the supplier may be less able to add value to other clients or to find other opportunities to generate business. Finally, the supplier's willingness to respond to client needs in new areas and make

further relationship-specific investments may be seen as a credible signal of commitment to the relationship (Schelling, 1960; Spence, 1973), which may help to reduce the likelihood of client loss and thus safeguard prior client-specific knowledge investments. Accordingly, when a supplier's clients undertake diversification, I posit that the supplier will be more likely to respond by also increasing its own diversification when it holds higher (as opposed to lower) levels of client-specific knowledge. Therefore, I propose:

> *H2. The greater the level of client-specific knowledge held by a supplier (developed through prior work for clients), the stronger the effect of clients' diversification on diversification by that supplier.*

Relational (client) Commitment

While the prior discussion explains how client-specific knowledge may provide suppliers with a relative advantage in taking on new business from that client, suppliers may also experience such an advantage if clients are more strongly committed in their relationships with them. Prior research suggests that a client can provide a credible signal of such commitment (Schelling, 1960; Spence, 1973) by allocating a greater share of its outsourced work to the supplier, which is in turn characteristic of more relational (as opposed to transactional) client-supplier relationships (Baker, 1990; Moeen, et al., 2013). By placing a greater reliance on the supplier for its outsourced needs, which makes it more difficult to switch its business to other suppliers, the client conveys positive expectations of relationship continuity to the supplier (Poppo et al., 2008). Client commitments of this nature may lead to higher levels of trust between the partners (Gulati, 1995; Kale et al., 2000) and additional relationship-specific

investments (Bercovitz, et al., 2006; Dyer, 1997; Williamson, 1983), as well as more elaborate informal relational governance (Macneil, 1980).

The mutual benefits realized when clients provide suppliers with greater relational commitment have often been noted by practicing managers. Consider, for example, the following quote from a legal executive at DuPont, which significantly concentrated its legal outsourcing to fewer external legal suppliers in order to establish more partnership-like relationships with them:

> "[Law] firms felt a greater commitment to DuPont when they were entrusted with our entire IP [intellectual property] business in their country or region. In many, the senior leadership on their own initiative undertook a study of DuPont's business and demonstrated an eagerness to adapt their practices to meet our needs. […] Our work now received much needed management attention and closer professional focus." (Dull & Gould, 2002).

A similar strategy from Tyco International, which concentrated its legal work into a single law firm, Eversheds LLP, led legal industry commentators to note:

> "The two-way partnership *ties the firm to the client but, just as crucially, ties the client to the firm*. Through the first 18 months of the deal, Eversheds has built up detailed inside knowledge of Tyco and the specific risks it faces. Changing outside counsel now would mean that Tyco has to go through the arduous process of educating a new firm. Breaking up has suddenly become a lot harder to do" (Neil, 2008, emphasis added).

Tyco's experience highlights two distinct – albeit related – reasons why suppliers who receive strong relational commitment from their clients may feel compelled to undertake client-led diversification. First, because the client is more closely tied to a focal supplier, the supplier's investments in servicing new client needs may be both warranted and better safeguarded. In

other words, being responsive to client requirements is a *quid pro quo* for client relational commitment, and the expectation of continued business (credibly signaled by client commitment) is a guarantor of the investments incurred in being responsive. Thus, in a repeated game between supplier and client, the future value of the relationship (shadow of the future) to which the client has already made a relational commitment (shadow of the past) may induce the supplier to conform to expectations of being responsive to client needs even in new areas (Poppo et al., 2008). In other words, these mutual client and supplier commitments may be self-enforcing (Telser, 1980; Williamson, 1983).

Second, greater relational commitment from a client implies that the focal supplier has the best opportunity (relative to other suppliers) to learn about the client, and exploit complementarities in its outsourced work. Transactional spillovers and resource interdependence between projects means that outsourcing can often lose its discrete attributes (Alchian & Demsetz, 1972; Macneil, 1980), which is a common feature of knowledge-based outsourced work (Moeen et al., 2013; Novak & Stern, 2009). In turn, the supplier with the greatest opportunity to undertake client work is most likely to develop the requisite knowledge that can be recombined and reused in related future work (Argyres & Zenger, 2012; Ethiraj et al., 2005; Mayer et al., 2012; Nonaka, 1994). Moreover, greater levels of inter-organizational knowledge transfer and the existence of complex inter-relationships and dependencies between projects may expedite the development of shared routines and a common language between the client and supplier (Mitchell & Singh, 1996; Zollo & Winter, 2002), which can in turn be a significant advantage for undertaking future outsourced work.

In summary, when relational client commitment is high (as signaled by giving the supplier a larger share of its business) the opportunity to leverage relational advantages into new

areas of business, along with the safeguards of relational governance and client commitment for such expansion, incentivizes suppliers to respond to client diversification by diversifying the scope of their own business in parallel. Aggregated over the supplier's entire portfolio of clients, this rationale suggests the following hypothesis:

> *H3. The greater the level of relational commitment provided by clients in a supplier's portfolio, the stronger the effect of client diversification on diversification by that supplier.*

Client Market Opportunity

The impact of client-specific knowledge and relational commitment on client-led diversification (discussed above) highlights the role of opportunities made available by relational advantages when a supplier's clients choose to diversify their outsourced work. However, it is important to ask what other conditions exist that may incentivize suppliers to grow their business and create value through client-led diversification, or alternatively, may compete with the opportunities stemming from existing clients. Put differently, what is the supplier's opportunity cost of diversifying in response to its clients' diversification? This question is important because it is well known that diversification is costly for firms in terms of the organizational costs of increased coordination, distributed managerial attention and dilution of focused, knowledge-based capabilities (Grant, Jammine, & Thomas, 1988; Hill & Hoskisson, 1987; Montgomery & Wernerfelt, 1988; Ocasio, 1997; Ramanujam & Varadarajan, 1989).

Compared to firms in capital intensive industries (e.g., manufacturing), knowledge-based service firms have advantages in mobilizing resources according to market conditions. For example, in rapidly growing markets, firms can reuse scalable resources, at least up to their

productive capacity (Levinthal & Wu, 2010), and can often redeploy excess resources into what are likely to be among their highest valued uses (Sakhartov & Folta, 2014). Additionally, price competition between firms is also likely to be lower in fast growing markets, resulting in higher price-cost margins for firms (Porter, 1980). Fast growing markets thus hold the potential to provide firms with significant opportunities for business growth and profitability. Indeed, prior research in legal services finds that greater demand in particular markets leads firms to deepen their capabilities in those markets in order to capture a greater share of new business (Garicano & Hubbard 2007). By the same logic, if more valuable opportunities existing in alternative markets, then firms may expand their business scope to take advantage of those opportunities (Sakhartov & Folta, 2014).

I maintain that higher growth in the markets of clients represents an attractive opportunity for suppliers to tap into and capture greater volumes of outsourced work. To be specific, market growth may represent a significant demand-pull for suppliers when the markets in which *clients* operate (i.e., the client's entire outsourced business portfolio) are growing at a greater pace than the existing markets served by suppliers. Moreover, suppliers can reduce the risks associated with diversification by using their existing clients as a platform to gain a market foothold. Alternatively, if clients diversify into markets that do not provide superior business opportunities than the suppliers' current markets, then supplier incentives to under-take client-led diversification are lower.

In sum, when the markets of a supplier's clients are growing at a faster pace relative to that supplier's existing markets, alternative options for creating value through diversifying into those markets are presented to suppliers. However, when suppliers operate in relatively faster growing markets than their clients do, they already enjoy significant opportunities to grow their

business profitably and thus have little incentive to diversify. Therefore, I present the following hypothesis;

H4. The higher the growth in the markets of (a supplier's) clients relative to growth in the markets of a supplier ("client market opportunity"), the stronger the effect of client diversification on diversification by that supplier.

Supplier Excess Capacity

The availability of organizational resources is an important criterion for the successful implementation of firm strategies. While firms may acquire requisite resources through strategic factor markets, forming strategic alliances, or undertaking merger and acquisition, they may also generate surplus internal resources in the form of excess capacity.

Although excess resource capacity may be generated through the failure to achieve aspirational performance goals (i.e., productive resources are under-utilized), firms also generate excess resource capacity through increasing task efficiency (Penrose, 1959) and routinizing organizational knowledge (Winter & Szulanski, 2002), which can then be applied to alternative strategies for increasing profitability and growing the firm (Mahoney, 1995; Penrose, 1959).

The relationship between excess firm resources and firm diversification has a long tradition in the resource-based management literature (e.g., Penrose, 1959; Teece, 1982). Although one strategic option for firms is to divest or contract out excess capacity through the market, the resource-based approach maintains that it may be more economically efficient for firms to redeploy those resources by entering new lines of business (Levy & Haber, 1986; Teece, 1982). More specifically, diversification is likely to be preferred over divestment or contracting

out when the transaction costs of using market mechanisms to reduce excess capacity are greater than the costs of internal redeployment (Teece, 1982).

For a number of reasons, the contracting out or divesting of excess resource capacity may not be a viable option for knowledge-based service suppliers. First, a supplier's critical resources are the human capital of its professional workforce. The trading of knowledge (i.e., contracting out), especially tacit knowledge, is fraught with impediments is generally considered difficult and costly to transfer (Argote & Ingram, 2000; Simonin, 1999; Szulanski, 1996), in addition to the transaction costs of negotiation, writing contracts, and appropriate governance mechanisms that safeguard proprietary knowledge. These costs and knowledge transfer difficulties are all but eliminated with internal resource transfer -- i.e., diversification. Second, contracting out employees to rival suppliers is likely to be strategically unattractive due to concerns of losing those employees on a permanent basis, and potentially clients who could switch their business. More fundamentally, however, the contracting out of excess resource capacity could lead to significant conflicts of interest in terms of clients, who often select their outsourced suppliers with at least some degree of consideration of the other clients a supplier serves (Maister, 1993; Coates et al., 2011).

Prior research findings support the notion that suppliers often prefer to use internal, rather than external, markets to redeploy excess resources. For example, Mishina and colleagues note firms apply excess capacity "…to new markets' and 'grow[th] by expanding our customer base and increasing our sales to existing customers'" (2004: 1187), while excess resources generated though client interaction have been found to lead to suppliers intensifying their future interactions with those clients (Voss, Sirdeshmukh, & Voss, 2008). Finally, practitioner evidence suggests that suppliers with excess capacity often prefer to intensify their search for new

business opportunities rather than releasing knowledge workers into the labor markets (Manch & Shannon, 2006; Olmstead, 2013).

Taken together, suppliers who build excess resources capacity in the process of efficiently serving clients are likely to have incentives to exploit those knowledge resources through internal redeployment – i.e., diversification. Because a significant proportion of supplier excess resources involve knowledge and routines that are more applicable to their existing clients (and these clients are a likely source of future new business), I suggest that when suppliers hold higher levels of excess resource capacity, diversification moves by their existing clients provide a demand opportunity, and therefore, incentives, for suppliers to redeploy those resources towards their own diversification strategies. I therefore provide the following hypothesis;

H5. The greater the excess resource capacity of a supplier, the stronger the effect of client diversification on diversification by that supplier.

SAMPLE AND METHODS

I tested my hypotheses using detailed longitudinal (1990-2000) data on a focal sample U.S. patent law firms (suppliers) and their corporate clients. I identified my patent law firm sample using the official roster of registered patent attorneys published by the Office of Enrollment and Discipline (OED) of the US Patent and Trademark Office (USPTO). As a requirement to practice patent law, patent attorneys must be admitted to and registered with the U.S. patent bar, after which they are listed on the patent attorney roster. My sample consists of patent law firms that employed at least ten patent attorneys in 1990 (to avoid survivor bias), at which time most of these law firms were specialized in patent (or intellectual property) law. Following prior research, I chose this cut-off to ensure that (i) suppliers in my sample undertook

sufficient volumes of patent legal work to build relational assets with innovative clients (Somaya et al., 2008)[13], and (ii) suppliers held sufficient resources to be meaningfully diversified (Montgomery & Hariharan, 1991). I initially identified 101 U.S. patent law firms, and subsequently dropped two firms with missing patent data and two firms that failed in the second year of our observation period, yielding a final sample of 97 firms.

I sought to examine the relationship between client and supplier diversification in patent prosecution work, which entails tasks related to the legal and administrative processes of writing and filing patent applications, and interacting with the USPTO until the patents are issued. To identify patents outsourced to my sample of patent law firms (suppliers), I obtained records of all utility patents filed (and subsequently granted) by the USPTO in the period 1986-2000. The prosecution work for each patent is a narrowly defined project that, if outsourced, represents an individual outsourcing transaction between a client and a supplier. I identified patents outsourced to my sample of suppliers by searching for each supplier's name in the "Attorney or Agent" field of the patent, and then manually cross-checking the returned firms to ensure accuracy and to rule out false positives in the search results.[14] Each patent record thus obtained uniquely identifies the law firm who prosecuted the patent, the client applying for the patent, and the technology classification of the invention. Using these detailed data from the patent records, I constructed year-by-year patent portfolios for each supplier. Including additional years for variable construction (1986-1990), I identified approximately 315,000 unique patents outsourced to my sample of suppliers by almost 39,000 clients.

[13] Somaya, Williamson, & Lorinkova (2008) found that patent law firms employing less than ten patent attorneys, on average, worked on less than one patent a year for their entire set of innovative Fortune 500 client firms (129 firms).

[14] For example, law firm Baker & Daniels was searched as "Baker & Daniels", "Baker Daniels", "Baker and Daniels" and "Baker"). If the search also returned patents with (say) "Marshall T. Baker" as the patent attorney (rather than the firm Baker & Daniels), these patents were dropped.

Dependent Variable.

Supplier Diversification: The dependent variable in this study measures the supplier's business scope, which in this case is the scope of patent legal services across different technological domains. Patent prosecution work requires both legal and technological expertise, and patent lawyers are required to have a technical background (typically at least a bachelors' degree), which enables them to understand inventions and to write and prosecute patent applications effectively. Thus, if a patent law firm were to expand its services into new technology domains, it would be undertaking work that needs different types of knowledge resources, implying a diversification of its business scope. I measured *Supplier Diversification* by employing the technology domains that patents are classified into under the International Patent Classification (IPC) system. Akin to the Standard Industrial Classification (SIC) system, the IPC system (but not the U.S. patent classification system) is a nested hierarchy where each group of lower-level classes is a subset of the technology class from the level above (Lerner, 1995).[15] Following past practice, I used the third level of technology classification (4-digit IPC class) to build my diversification measure (Lerner, 1995; Moeen et al., 2013), which provides a good balance between granularity and meaningful technological distinctions. I calculated the supplier's diversification across different technological domains with a Herfindahl-Hirschman index (HHI) (Palich, Cardinal, & Miller, 2000; Yang, Narayanan, & Carolis, 2013), using the fractions of the law firm's patents across 1806 4-digit IPCs, and subtracting this HHI index from one to obtain a diversification measure. Specifically, for each supplier *i* in year *t* I measure:

[15] IPC classes are of the form XNNY/nnn/mm, where X denotes the "section" and NN is a number signifying the "class" and Y is the "subclass"; nnn and mm and three and two digit numbers denoting the "group" and "subgroup" within this class. For example, A61B contains technologies relating to "DIAGNOSIS; SURGERY; IDENTIFICATION," which falls under the section A covering "Human Necessities" and the Class 61 covering "HEALTH; LIFE SAVING; AMUSEMENT." See: http://web2.wipo.int/ipcpub/#refresh=page&notion=scheme&version=20140101&symbol=A61 (accessed 08/03/2014).

$$HHI_{it} = \left(1 - \sum_{k=1}^{n} N_{ikt}^2\right)$$

where N_{ik} is the share of supplier *i* patents in the k^{th} IPC, and *n* is the total number of IPCs. HHI measures from count data can be biased (Hall, 2002), and more so when the counts are small. I followed Hall (2002) in correcting my HHI measure for this bias, as follows:

$$Supplier\ Diversification = \frac{(N_{it} * HHI_{it}) - 1}{N_{it} - 1}$$

where N_{it} is the total number of patents for supplier *i* in year *t* . The variable is highly skewed, so I use a logged version of this measure in my models to reduce heteroskedasticity.[16]

Independent Variables

Client Diversification. I measured *Client Diversification* as the diversification "away from the supplier" of the outsourced patent prosecution work of all clients in a supplier's portfolio, weighted by each client's share in the supplier's total business. Accordingly, I first constructed a clients' scope vector (where each vector dimension is one 4-digit IPC) that represents the weighted average footprint of a supplier's portfolio of clients across different IPC technology domains. I then calculated a clients' HHI index ("clients HHI") using these weighted clients' patent shares, and then applied the Hall (2002) bias correction. Although I am interested in aggregate diversification of the supplier's clients, I also need to be concerned about whether

[16] Specifically, supplier diversification is measured as [1 – ln(HHI*10000)/ln(10000)]. Multiplying by 10,000 yields an HHI computed with percentages, which ensures that the logs are positive. This slightly complex transformation reflects the fact that the variable skews to the left (so the log transformation needs to be applied to the HHI term, rather than (1-HHI)).

this diversification occurs in a direction that is towards or away from the supplier's extant business scope. For example, what constitutes a newer domain for clients may be a core area of business for the supplier, which is unlikely to lead to supplier diversification. Accordingly, I calculated whether clients diversified away from a supplier's business scope by calculating the Mahalanobis Distance between the clients' scope vector and the supplier's own scope vector, measured by the shares of its patents across IPC technology domains over the prior three years.[17] The *Client Diversification* variable was then computed as the product of 1-clients' HHI and Mahalanobis Distance, so that client diversification into IPCs having low overlap with the supplier's scope is given more weight in my measure.

Client-Specific Knowledge. Following prior research, I employed patent backward self-citations as a measure of clients' firm-specific knowledge held by the supplier (Moeen et al., 2013; Wang & Chen, 2010; Wang et al., 2009). Backward patent citations indicate the body of prior knowledge that the focal patent builds on, and backward *self*-citations indicate that the focal patent builds on patents that belong to the same client. Thus, if a law firm has worked on patents with a higher proportion of backward self-citations in the past, the firm would likely have developed deeper knowledge of its clients' unique technologies (and in turn their businesses). I computed my measure of *Client-Specific Knowledge* for each supplier by the average percentage of backward self-citations (relative to all citations) in the law firm's patent prosecution work in the prior three years.

[17] Mahalanobis Distance has an advantage over Euclidean Distance in that it corrects for correlations between the organizational dimensions on which the distance is being calculated (Kim & Finkelstein, 2009). Because the Mahalanobis Distance does not have an upper bound of one, I divided it by 100 so that my final client diversification measure (like supplier diversification) varies between zero and one.

Relational (client) Commitment. For each client in my sample, I obtained the number of patents outsourced to US patent law firms, and calculated the three-year percentage of those outsourced patents to each of the supplier in my sample. In this way, I identified the share of patent work that each supplier captures from its clients, where a higher share indicates that the client has made a greater relational commitment to a particular supplier (Moeen et al., 2013). In turn, I aggregated these supplier-client business shares to compute a portfolio-level measure of *Relational (client) Commitment* for the supplier by weighting with the fraction of the supplier's business from each client in the previous three years.

Client Market Opportunity: I calculated the extent to which greater new business opportunities for suppliers exist in the markets of clients, relative to the focal supplier's own markets, as the difference between growth in the markets of a supplier's clients and growth in markets of that supplier. Using the universe of patents applied to, and granted by, the USPTO, I computed a running three-year log- growth in the number of patents in each 4-digt IPC technology domain, and used these growth rates to compute separate measures for "client market growth" and "supplier market growth". Specifically, for each supplier *i* in year *t*, I measured[18];

$$Client\ Market\ Opportunity_{it} = \sum_{j=1}^{n}\left[\left(\sum_{k=1}^{n} P_{jkt}\right) * N_{ijt}\right] - \sum_{k=1}^{n} N_{ikt}$$

where P_{ikt} is the three-year log-growth of patents in each IPC *k*, weighted by the three-year fraction of client j patents in IPC *k*, N_{ijt} is the three-year fraction of client *j* patents accounted

[18] Where the first term is client market growth and the second term is supplier market growth.

for in supplier i's business portfolio, and $N_{ikt}$is the three-year share of supplier i's patents in each IPC k.

Supplier Excess Capacity: Suppliers may generate excess resource capacity when serving clients more efficiently, which allows them to increase to their volume of new business relative to the size of their workforce. For example, the codifying of client-specific knowledge decreases the time and costs associated with learning about clients' new needs, while the construction of client-specific routines creates efficiencies for knowledge-transfer and service delivery. In addition, refined intra-firm coordination mechanisms and organizational-level routines for handling large volumes of business are likely to release resources at the individual-level (i.e., the time of employees) which can be deployed towards searching for new business opportunities. Thus, the ability of patent attorneys to take on higher levels patent legal work is an indicator of a supplier's resource capacity. Accordingly, for each supplier, I obtained the total number of patents filed in the focal year and then divided this figure by the number of patent attorneys registered at the USPTO as employed by that supplier in the same year. Effectively, I computed the average number of patents worked on by each patent attorney.

Control Variables

In addition to the moderating variables - *Client-Specific Knowledge, Relational (client) Commitment, Relative Market Growth, and Supplier Excess Capacity* – whose main effects are included in our models, I also controlled for a number of firm-level covariates that change over time. As described below, my fixed effects models already control for average firm and year level variation – whether observed or unobserved – in the data. *Occupational Expertise* is

calculated as the percentage of patents in the patent work undertaken by the supplier that cite any previously litigated patent. Such patents are themselves about six times more likely to be subject to litigation than an average patent, which places a premium on more fungible legal expertise (as opposed to technology-specific expertise) during patent prosecution (Mayer et al., 2012). *Non-patent Citation Share* is measured as the three-year share of non-patent prior art citations (such as citations to academic publications and research presentations) among all citations in a supplier's patent portfolio. A higher share of non-patent prior art citations may be another indicator of supplier specialized knowledge, but which is broadly applicable across technology domains. *Supplier Size* is measured as the number of patent attorneys employed by the supplier in the prior year. Larger firms typically have greater multi-use assets that can be leveraged into new markets at a lower marginal cost than smaller firms (Montgomery & Hariharan, 1991; Penrose, 1959). *Supplier Turnover* is measured for each supplier as the three-year percentage of patent attorney exits to the three-year average number of patent attorneys. A high turnover of attorneys can deplete a supplier's critical resources (Coff, 1999) and can lead to the dissolution of client relationships (Broschak, 2004). *Client Size*; I proxy the average size of a supplier's clients by measuring the total level of innovation from clients within a supplier's portfolio. For each year, I coded the number of patents obtained by each client and weighted those patents by the fraction of a supplier's business accounted for by that client in the previous three years to compute a weighted average measure of client innovation for each supplier in each year. Larger clients may have a broader spectrum of outsourced needs but may also be more challenging for suppliers to build relational capital. *Outsourced Percentage* is computed as the three-year percentage of patents outsourced by each client (as a fraction of total patents for each client) in a supplier's portfolio, weighted by the three-year fraction of that suppliers' total business

accounted for by each of those clients which is then aggregated across all clients within the suppliers' portfolio. Clients who outsource a greater share of their patent prosecution work are more likely build deeper relationships with suppliers (Moeen et al., 2013).

Econometric model

I am interested in modeling dynamic changes to supplier diversification over time as the outsourced needs of their clients change. My unit of analysis is supplier-year and my data are organized in longitudinal supplier panels over time. Therefore, I employ panel data econometric techniques to model *changes* in supplier diversification over time. Specifically, I fit an Ordinary Least Squares (OLS) panel data model that incorporates firm fixed effects with a full set of year indicator variables. A significant test statistic in the Hausman specification test (Hausman, 1978) indicated that I should prefer a fixed effects OLS model to the alternative random effects OLS model. A significant F statistic (Wald test) also rejected the null that all year coefficients are jointly equal to zero. As described earlier, I lagged my independent and control variables by one year to mitigate reverse causality. Finally, I correct for error structures that are not independently and identically distributed (in particular heteroskedastic and within-firm correlated errors) by computing robust standard errors clustered by firm. My fixed effects OLS estimates identify the covariates of within-firm changes in diversification while holding constant unobserved time-invariant differences between firms and secular yearly changes across the entire set of firms in my sample.

RESULTS

Tables 3.1 and 3.2 report, respectively, the summary statistics and correlation matrix of variables. A Variance Inflation Factor test indicated that multicollinearity is not a concern in my model. Table 3.3 presents the main results from my fixed effects OLS model. Model 1 includes only the control variables. Model 2 reports the results for hypothesis 1, which predicted a positive relationship between the scope of outsourced client needs and the horizontal scope of suppliers. The coefficient of *Client Diversification* is positive and significant at the 5% level indicating empirical support for hypothesis 1 in my data.

Model 3 tests hypotheses 2 and 3, which predict that relational assets -- specifically the supplier's *Client-Specific Knowledge* and the client's *Relational (client) Commitment* -- will strengthen the client-led diversification effect found in Model 2 (results are identical if I model each interaction separately). Model 3 finds that the coefficient of the interaction between *Client-Specific Knowledge* and *Client Diversification* is positive and significant at the 5% level, suggesting empirical support for H2. Thus, suppliers with higher levels of client-specific knowledge are more likely to respond to their clients' diversification into new areas. Similarly, I find that the coefficient of the interaction between *Relational (client) Commitment* and *Client Diversification* is positive and significant at the 5% level, suggesting empirical support for H3. Thus, when suppliers find themselves in outsourcing relationships to which clients have made significant relational commitments, they are more likely to undertake client-led diversification. Moreover, in Model 3 (and the full model – Model 6) the independent effects of client-specific knowledge and client relational commitment, included in my models as control variables, are negative and significant. These coefficients show that, without client diversification, suppliers with higher relational assets are *less* likely to diversify, indicating that these specialized

resources generally limit diversification opportunities for supplier firms. Taken together, the two sets of coefficients highlight the client-specific nature of synergies made available by relational assets.

I graphically interpret the two interactions from Model 3 in Figures 3.1 and 3.2, in each case by holding the level of the other interacted variable (relational (client) commitment and client-specific knowledge, respectively) at its mean. Figure 3.1 shows that higher levels of *Client-Specific Knowledge* reduce the extent of supplier diversification in general, but increase the propensity of suppliers to undertake client-led diversification. Figure 3.2 illustrates a similar relationship for *Relational (client) Commitment* – while supplier diversification generally increases with client diversification, the slope is higher when relational commitment is high (as opposed to low). The graphs also help to interpret the negative sign on the coefficient of *Client Diversification* in Model 3, and this coefficient cannot be understood without the interaction terms. As the figures show, supplier diversification generally increases with client diversification; therefore, the negative coefficient should be interpreted as the residual effect when the interaction terms are zero, which never occurs within the range of my data.

Model 4 presents my test of hypothesis 4 – the interaction between client diversification and *Client Market Opportunity*. However, I find no support for this hypothesis, indicating that greater demand opportunities in client markets relative to the supplier's existing markets are not sufficient for suppliers to increase their tendency to undertake client-led diversification. Figure 3.3 confirms the statistical findings of H4. We see that while supplier diversification is on average higher when client diversification is also higher (as per H1), there is no significant difference in the two slopes represented by high and low relative market growth.

Model 5 tests hypothesis 5, which is the interaction between client diversification and *Supplier Excess Capacity*. The coefficient of this variable is positive and significant at the 1% level, offering strong statistical support for H5 and suggesting that suppliers with greater availability of resources are more likely to undertake client-led diversification. It is also notable that in Model 5 (and the full model) that the independent effect of *Supplier Excess Capacity* has a strong negative effect on the tendency of suppliers to diversify. This result indicates that, absent client diversification, suppliers choose to apply excess resources to exploiting markets within their current portfolio. Figure 3.4 graphically illustrates H5 and shows that higher *Supplier Excess Capacity* reduces supplier diversification in general, but when client diversification is higher, the slope for supplier diversification is higher when supplier excess capacity is high (as opposed to low). As discussed above, my findings in the full model – Model 6 – are fully consistent with the earlier models.

Taken together, my findings provide substantial support for client-led diversification and the influence of relational assets on this driver of supplier scope. However, while the availability of supplier resources increases likelihood client-led diversification, my findings suggest that greater demand opportunities in client markets (relative to supplier markets) do not have a similarly positive effect.

Limitations

My findings are not, however, without limitations. First, the legal services industry is archetypal of knowledge-based services, and my context provides rich fine-grained project-level data with which to test my propositions. However, there may be heterogeneity across knowledge-based service industries regarding the extent to which relational assets and relational

advantage matter in outsourcing. Although research in advertising (e.g., Baker et al., 1998; Broschak, 2004; Rogan, 2014a; Rogan, 2014b), investment banking (Baker, 1990), and auditing (Levinthal & Fichman, 1988; Seabright et al., 1992) provide strong empirical support for the importance of relational assets and relational embeddedness, my findings may not generalize to other knowledge-based service contexts and thus more research is required in contexts outside of legal services in regards to how such relational advantages and client diversification impact supplier scope.

Second, my research focuses on firms providing specialized work within patent legal services, but the drivers of corporate strategy in firms providing services across multiple legal services domains may be somewhat different from the firms in my sample. While I was not able to identify the scope of legal services (outside of patent legal services) offered by firms in my sample, I did identify 12 firms that were listed in the annual National Law Journal (NLJ) rankings of the largest, and typically highly diversified, 250 corporate law firms. I removed these firms from my sample and ran my main regression models (from Table 3) again. Although I did not find statistical support for H1 or, again, H4, all other hypotheses were supported, thereby corroborating my main thesis that client-led diversification is driven by relational assets held between suppliers and clients (see Appendix B).

Third, this study has limitations in terms of measurement. In particular, while my theorizing draws strongly on the notion of relational governance, I lack a direct measure for this construct. Prior work has captured relational governance through survey instruments, but this is not a viable option for longitudinal data such as those employed in this study. My measure of supplier excess resource capacity is also subject to limitations. Specifically, I only captured one possible mechanism through which excess capacity may be generated. Indeed, it is also possible

that suppliers with a low volume of patents per attorney hold excess capacity through capturing insufficient levels of new business. In addition, suppliers can often increase their volume of new business by employing relatively more junior employees to managers (i.e., increase their leverage ratio). However, I am unable in my dataset to identify the hierarchical level of patent attorneys. Therefore, my measure of supplier excess capacity, while valid, is only limitedly so, and future research may seek to identify a more robust measure of excess capacity for knowledge-based service suppliers.

Finally, although my focus has been on knowledge-based services (which are now a very large and growing sector of the economy), my theoretical logic may also apply to manufacturing and other sectors; however, it is very difficult to generalize my empirical findings to these settings and, again, represents, a limitation of my study but also an area for future research.

Additional Analyses

The present study investigates how firm-level relational capital developed within supplier-client relationships impacts supplier diversification. However, we must also consider that relational capital can also build at the individual-level (Kale et al., 2000). Accordingly, I examined if, and to what extent, my results could be explained by individual-level mechanisms. If individual-level factors are important, I would expect this to be picked up through employee mobility (Broschak, 2004; Somaya et al., 2008) such that suppliers with higher employee turnover should be less inclined to undertake client-led diversification, particularly where relational assets are concerned. Accordingly, I split my sample by high and low (median) turnover suppliers and re-ran my main models. The findings from my sub-sample of high

turnover suppliers corroborated my main predictions and rejected the notion that my findings are driven by individual-level mechanisms.

Another, related, logic is that relational capital is localized within a particular area of the client firm and may not easily transfer to another client department division. This implies that suppliers may be more likely to build relational assets with smaller, as opposed to larger, clients, and which would bias my results to favoring those suppliers with a number of smaller clients. Again, I split my sample by average (median) client size and ran my models on the two sub-samples. While the direct effect of client diversification on supplier diversification (H1) was positive but not significant, robust statistical support remains for the interaction effects of client-specific knowledge (H2) and relational commitment (H3). Taken together, my additional analyses rule out the alternative explanation of client-led diversification being driven by individual-level mechanisms and support my theorizing that suppliers build relational capital at the firm-level, which they then leverage into diversification strategies.

Finally, because relational capital is a shared resource between exchange partners, I should consider the possibility that that the scope strategy of suppliers could drive the scope of clients. In other words, I need to examine and empirically rule out reverse causality, which I address as follows. First, my fixed effects model has a lagged structure that ensures a causal relationship from client diversification to supplier diversification. Second, a Granger (1969) causality test did *not* support supplier diversification as useful for predicting client diversification. Third, theoretically and practically, client outsourcing strategies for patent legal work are make or buy decisions for the intellectual property of technology. It is unlikely that clients would devise or change their innovation strategy (i.e., which technology to produce) based on the scope of their legal suppliers. Therefore, taken together, my model structure,

additional empirical tests, and context provide confidence that reverse causality should not be a concern in the current study. Appendix B presents the results of my additional analyses.

DISCUSSION

In this study, I articulated a novel theoretical link between relational advantage and corporate scope leading to the phenomenon of client-led (or partner-led) diversification. Using a sample of patent law firms, I found significant empirical support for the proposition that these supplier firms expand business scope when their clients also diversify (away from areas that the supplier operates in), and that this effect is stronger when the supplier shares key relational assets – specifically, client-specific knowledge and client relational commitment – with its portfolio of clients. I also found robust empirical support for client-led diversification when suppliers have spare productive resources to apply to diversification strategies. In contrast to extant research that typically considers that firms apply excess resources to enter related markets (e.g., Penrose, 1959; Teece, 1980; 1982), I found that suppliers can apply excess resources to enter markets that are *less* related to their current knowledge base. Surprisingly I found no empirical support for the prediction that greater demand in client markets relative to suppliers' own markets increase the proclivity of client-led diversification. I investigated this result further by running my models on client market growth and supplier market growth as separate variables. We would expect growth in client markets to induce client-led diversification while growth in a suppliers own markets to diminish the value of relational assets and allow suppliers to profitably grow without costly diversification (Balakrishnan & Wernerfelt, 1986; Mitchell & Singh, 1996; Moeen et al., 2013). However, I again found no statistical support for either of these predictions. It is unclear if this lack of empirical support is driven by the suboptimal behavior by firms, who

may take on easy business from existing clients despite attractive market opportunities (that may be costly to develop), or if it is an anomaly of my data and measures. However, the resolution of these questions must await future research. Subject to the limitations noted in the previous section, my research has a number of implications for the literatures on relational advantage and corporate strategy, which I discuss below.

First, while prior research in the relational view has highlighted the value of relational assets shared between exchange partners (Dyer & Singh, 1998; Kale et al., 2000; Madhok & Tallman, 1998), the focus of this literature has primarily been on value creation and performance outcomes at the dyadic level (e.g., Chatain, 2011; Dyer, 1996; 1997; Dyer & Chu, 2003; Wang et al., 2009; Zaheer et al., 1998). My study extends research in the relational view by going beyond the dyad to examine the firm-level impacts of relational assets embedded in a firm's *portfolio* of relationships (e.g., Mitchell & Singh, 1996; Moeen et al., 2013), and assessing their implications for the corporate strategy – specifically horizontal scope – of firms. However, my research also leaves unanswered a number of important questions that can be addressed by future work. For example, my research does not answer the question of which partner firm should take the lead in diversification, and under what conditions. While it may make sense in the context of professional service firms that clients or buyers may lead suppliers' diversification, it is conceivable in other contexts that downstream firms – such as assemblers or distributors – may be led to diversify by their suppliers. Moreover, it is unclear if the theoretical logic I develop will also extend to partner firms who are not vertically related, such as R&D alliance partners who may plausibly lead each other in diversifying into new technological areas. Finally, another important dimension remaining to be explored is the impact on firm performance, including potential negative impacts, of relationally-driven changes in corporate scope. Consequently, I

believe that the current study has the potential to stimulate a robust program of academic inquiry into a hitherto underexplored area within the relational view; namely the many implications of the relational view for firms' (horizontal) corporate-level strategies.

Second, my research further underscores the importance of relational governance and relational assets in shaping buyer-supplier relationships. Because of their role in creating relational value, mutual assets and commitments can play a role in value-based strategies (Brandenburger & Stuart, 1996; Chatain & Zemsky, 2007) and in turn provide suppliers with an advantage in getting business from their existing buyers (Chatain, 2011; Hoetker, 2005; Maister, 1993; Mayer et al., 2012). At the same time, these relational assets are also critical for safeguarding future relation-specific investments and may simultaneously bear the expectation of continued mutual investments and responsiveness to partners' needs (Bercovitz, et al., 2006; Dyer, 1997; Macneil, 1980; Moeen et al., 2013; Poppo et al., 2008a). My findings show that these impacts of relational assets and commitments may strengthen the tendency of suppliers to undertake diversification in response to their buyers' needs. In turn, the willingness to undertake such diversification may itself be a component of relational governance and trust in the exchange relationship, as well as of supplier advantage in adding value to future projects with the buyer, which remains to be explored in future work.

Traditional resource-based explanations of diversification in the management literature are grounded in theories of synergistic resource sharing by firms across related lines of business to capture scope economies (Chatterjee & Wernerfelt, 1991; Levinthal & Wu, 2010; Teece, 1982), or the redeployment of under-utilized resources within the firm (Penrose, 1959; Sakhartov & Folta, 2014). My research casts partner-specific resources and commitments as special types of such resources that can support diversification; however, because these resources are

specialized to a particular transaction partner the opportunities for generating synergies or redeploying these resources are also limited to that partner. It is no surprise, then, that my findings indicate that relational assets are negatively associated with diversification in general, but increase supplier firm diversification in response to partner (client) diversification. Thus, a central contribution of my study to the extant diversification literature is that a firm's horizontal scope can be driven by its vertical relationships. In turn, these findings are related to an emerging literature that emphasizes the role of managerial slack in forcing tradeoffs between the horizontal and vertical scope of the firm (e.g., Brahm, Parmigiani, & Tarijan, 2013; Rawley & Simcoe, 2010). Interestingly, a reduction in vertical scope inherently implies the creation of vertical relationships, which may in turn drive horizontal scope based on the logic developed in this chapter; thus further investigation and integration of the mechanisms driving these two streams of scholarship is an intriguing prospect for future research. Last but not least, the expansion of horizontal scope by firms to leverage their partner-specific relational assets is fraught with questions regarding the opportunities and challenges posed by such diversification. Firms may find that their relational assets facilitate the acquisition of resources and capabilities to operate successfully in new business areas, and at the same time strain their managerial resources and incur diseconomies of scope. Future research may investigate which of these two effects dominate, and under what conditions. In summary, it is my hope that the current study will spur a renaissance of research that further explores the fertile intersection of the relational view and corporate strategy.

TABLES AND FIGURES

Table 3.1: Summary statistics of key variables

Variables	Mean	S.D.	Min	Max	Between S.D.	Within S.D.
Supplier Diversification	0.40	0.08	0.13	0.59	0.06	0.05
Client Diversification	0.22	0.07	0.01	0.45	0.06	0.04
Client Specific Knowledge	0.10	0.04	0.02	0.25	0.03	0.02
Relational (client) Commitment	0.45	0.16	0.01	0.76	0.11	0.01
Client Market Opportunity	-0.04	0.05	-0.30	0.38	0.04	0.05
Supplier Excess Capacity	10.08	10.68	0.03	89.42	9.60	4.03
Occupational Expertise	0.02	0.01	0.00	0.06	0.01	0.01
Non-Patent Citation Share	0.13	0.08	0.02	0.46	0.07	0.03
Supplier Size	33.47	27.56	6.00	189.00	25.38	9.14
Client Size	42.76	78.81	0.038	533.30	66.09	37.91
Turnover	0.08	0.08	0.00	0.54	0.05	0.07
Outsourced Percentage	0.71	0.11	0.13	1.00	0.08	0.08

Table 3.2: Correlations between variables

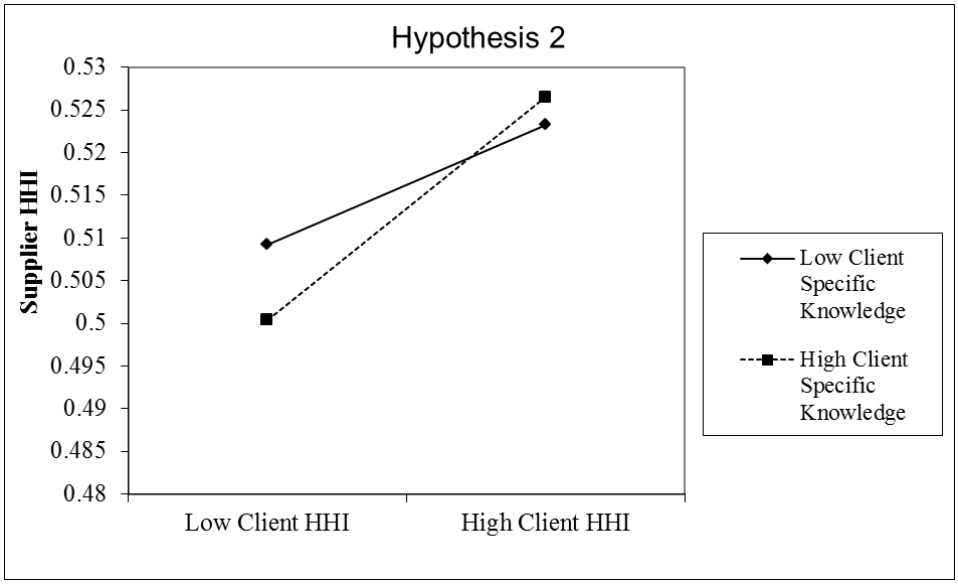
	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1.	Supplier Diversification	1											
2.	Client Diversification	0.22	1										
3.	Client Specific Knowledge	-0.03	0.21	1									
4.	Relational (client) Commitment	-0.05	0.13	-0.05	1								
5.	Client Market Opportunity	0.02	-0.05	0.06	0.00	1							
6.	Supplier Excess Capacity	0.04	0.48	0.27	0.08	0.13	1						
7.	Occupational Expertise	-0.34	-0.20	-0.13	0.23	-0.19	-0.33	1					
8.	Non-Patent Citation Share	-0.31	0.01	0.01	0.00	-0.21	-0.12	0.28	1				
9.	Supplier Size	-0.09	0.42	0.22	-0.02	-0.12	-0.02	0.11	0.32	1			
10.	Client Size	-0.33	0.49	0.42	-0.01	0.16	0.58	-0.16	0.11	0.38	1		
11.	Turnover	0.00	-0.04	0.06	0.01	0.08	0.14	-0.05	0.15	0.08	0.09	1	
12.	Outsourced Percentage	-0.02	-0.10	0.08	0.38	0.34	0.11	0.05	-0.20	-0.18	0.10	0.05	1

Table 3.3: Determinants of supplier diversification (fixed effects ordinary least squares model)

Independent Variables		1	2	3	4	5	6
Client Diversification	H1		0.214**	-0.531*	0.224**	0.0695	-0.603*
			(0.0949)	(0.311)	(0.108)	(0.120)	(0.319)
Client Diversification * Client Specific Knowledge	H2			4.245**			3.694**
				(1.723)			(1.739)
Client Diversification * Relational (client) Commitment	H3			0.791**			0.811**
				(0.385)			(0.385)
Client Diversification * Client Market Opportunity	H4				0.206		0.202
					(1.005)		(1.026)
Client Diversification * Supplier Excess Capacity	H5					0.0165***	0.0144**
						(0.00571)	(0.00615)
Client Specific Knowledge		-0.324*	-0.285	-1.030**	-0.289	-0.256	-0.917**
		(0.174)	(0.176)	(0.395)	(0.175)	(0.175)	(0.407)
Relational (client) Commitment		-0.0299	-0.0534	-0.190**	-0.0535	-0.0335	-0.176**
		(0.0393)	(0.0382)	(0.0787)	(0.0383)	(0.0395)	(0.0800)
Client Market Opportunity		0.0428	0.0448	0.0333	0.00610	0.0523	0.00469
		(0.0606)	(0.0603)	(0.0591)	(0.216)	(0.0611)	(0.223)
Supplier Excess Capacity		0.000379	-0.000372	-0.000520	-0.000384	-0.00508***	-0.00462**
		(0.000876)	(0.000819)	(0.000821)	(0.000817)	(0.00176)	(0.00186)
Occupational Expertise		0.352	0.280	0.381	0.288	0.281	0.392
		(0.615)	(0.590)	(0.591)	(0.590)	(0.573)	(0.579)
Non-Patent Citation Share		0.0345	0.0746	0.0135	0.0721	0.0750	0.0164
		(0.109)	(0.113)	(0.105)	(0.111)	(0.109)	(0.101)
Supplier Size		5.57e-05	-0.000216	-0.000360	-0.000210	-0.000225	-0.000348
		(0.000344)	(0.000332)	(0.000303)	(0.000329)	(0.000318)	(0.000290)
Client Size		-0.0574**	-0.0690***	-0.0640***	-0.0691***	-0.0541**	-0.0503**
		(0.0264)	(0.0261)	(0.0240)	(0.0261)	(0.0265)	(0.0240)
Turnover		0.00339	0.000425	0.000172	0.000147	0.0141	0.0115
		(0.0345)	(0.0343)	(0.0328)	(0.0340)	(0.0352)	(0.0334)
Outsourced Percentage		0.00504	0.0185	0.00836	0.0202	0.0133	0.00589
		(0.0412)	(0.0443)	(0.0441)	(0.0447)	(0.0433)	(0.0436)
Constant		0.507***	0.480***	0.617***	0.477***	0.482***	0.608***
		(0.0513)	(0.0577)	(0.0763)	(0.0586)	(0.0559)	(0.0781)
Year Fixed Effects		Y	Y	Y	Y	Y	Y
Robust Standard Errors		Y	Y	Y	Y	Y	Y
Observations		840	840	840	840	840	840
R-squared		0.125	0.141	0.168	0.141	0.156	0.178
Number of Suppliers		97	97	97	97	97	97

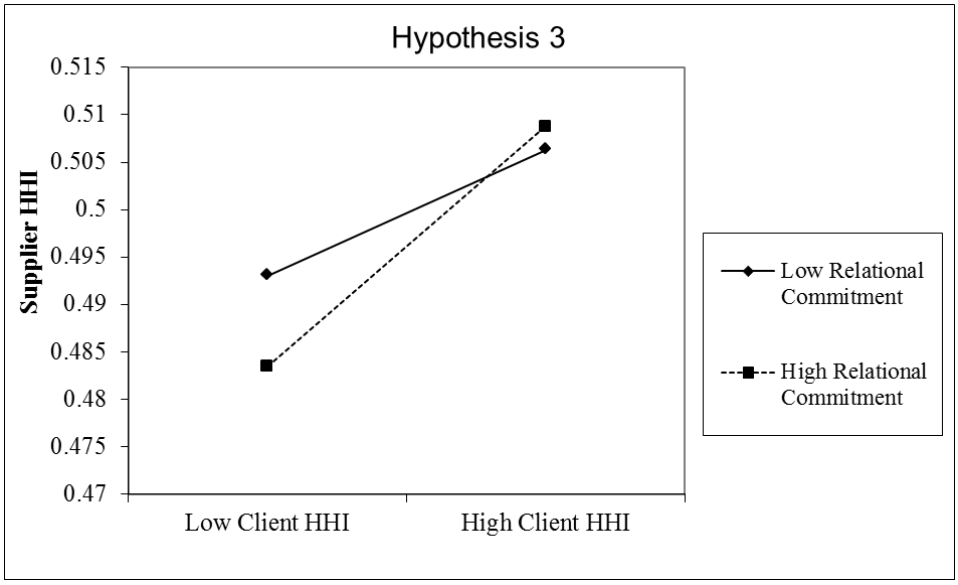
Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 3.1: Interaction effect of client diversification and client specific knowledge on supplier diversification



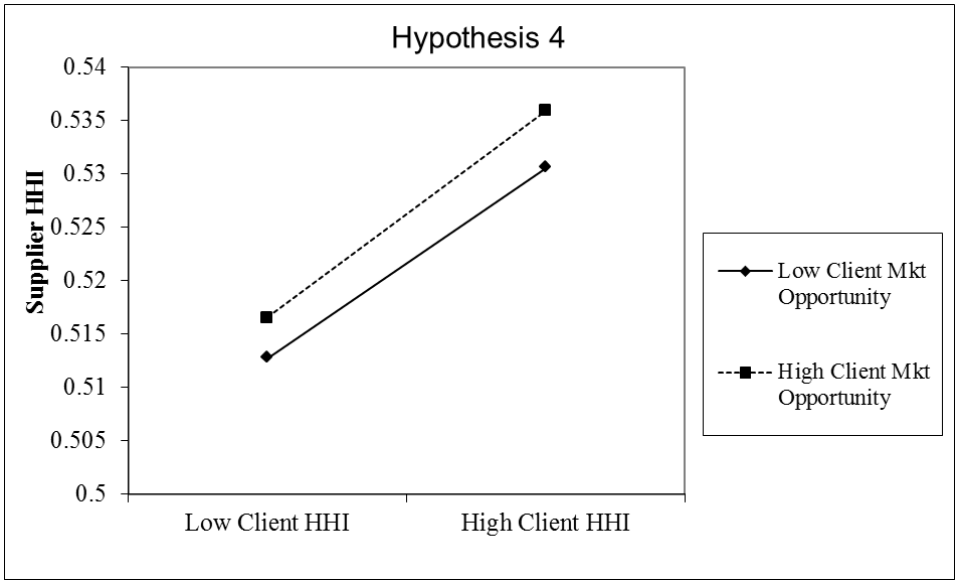
Note: High and low values are one standard deviation above and below the mean, respectively.

Figure 3.2: Interaction effect of client diversification and relational (client) commitment on supplier diversification



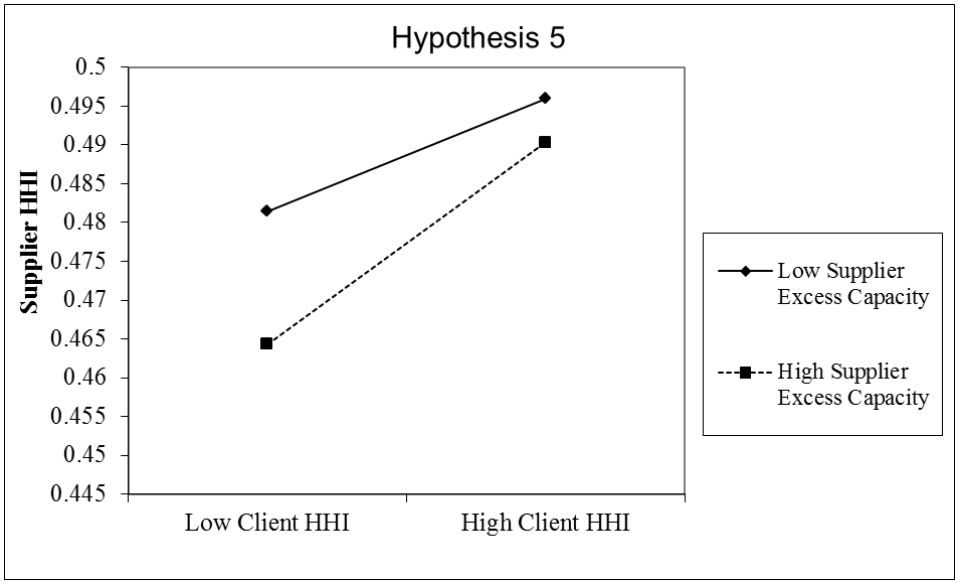
Note: High and low values are one standard deviation above and below the mean, respectively.

Figure 3.3: Interaction effect of client diversification and client market opportunity on supplier diversification



Note: High and low values are one standard deviation above and below the mean, respectively.

Figure 3.4: Interaction effect of client diversification and supplier excess capacity on supplier diversification



Note: High and low values are one standard deviation above and below the mean, respectively.

CHAPTER FOUR

CORPORATE SCOPE AND THE SURVIVAL OF KNOWLEDGE-BASED SERVICE FIRMS

INTRODUCTION

A firm's business scope -- or level of diversification -- is a fundamental strategic concern for managers, and understanding both the drivers of a firm's portfolio of businesses and the implications for firm performance have dominated scholarly thought for decades (Hoskisson & Hitt, 1990; Palich et al., 2000; Ramanujam & Varadarajan, 1989; Robins & Wiersema, 1995; Wan et al., 2011). For knowledge-based service suppliers, such as law firms, management consultancies, and advertising agencies, prior research suggests that a broader scope of client services offers the potential for superior firm performance as suppliers can conduct a greater volume of transactions with clients and reduce the competition they face for client business (Chatain, 2011; Chatain & Zemsky, 2011; Klemperer, 1992; Maister, 1993; Siggelkow, 2003). In turn, suppliers fulfilling multiple service needs of clients can often leverage their greater understanding of clients' business to develop specialized inter-organizational resources and capabilities that increase relationship performance and strengthen ties between those exchange partners (Dyer & Singh, 1998; Zaheer & Venkatraman, 1995). When formulating and implementing their diversification strategies, suppliers may exploit these "relational assets" that lead to advantages in gaining new business from existing clients (Chatain, 2011; Dyer & Singh, 1998; Kale et al., 2000) and to adjust (or "by adjusting") their business scope as new needs of clients emerge (Mawdsley & Somaya, 2015). Alternatively, suppliers may compose their scope of services in line with broader market opportunities and formulate strategies for capturing

greater volumes of business from new, rather than existing, clients (Porter, 1996). While the former, relational-focused, strategy creates value through committed and stable client ties, the latter, market-focused, strategy creates value through maintaining resource and market flexibility (Ghemawat & del Sol, 1998), and there are potential benefits and tradeoffs to both approaches.

Despite the insights from prior research regarding the impacts of corporate scope and relational assets for firm and relationship performance, understanding how these factors impact firm *survival* is relatively less clear. Indeed, studies have only recently begun to explore linkages between corporate scope and organizational survival (or failure) (e.g., Barnett & Freeman, 2001; Bercovitz & Mitchell, 2007; Sorenson et al., 2006; Stern & Henderson, 2004), and research findings are equivocal. For example, all else equal, there appears to be a consensus that a broader business scope brings survival advantages for firms, but when examining underlying contingencies, firms may be more likely to *fail* if they expand into less related markets (Sorenson et al., 2006), broaden their scope too quickly (Barnett & Freeman, 2001), or if competitors also introduce new products (Stern & Henderson, 2004). Moreover, the *implementation* of a diversification strategy can increase the risk of firm failure (Sorenson et al., 2006).

The research literature connecting relational assets to firm survival is also relatively sparse. What research has been produced suggests long-term buyer-supplier relationships increase supplier survival rates when relational assets are important for buyer needs (Hoetker et al., 2007). However, when a firm's portfolio of relationships becomes over-embedded, vulnerability to *failure* can increase (e.g., Uzzi, 1997). Other studies show that collaborative alliance relationships can increase firm failure when one exchange partner depends greatly on the other partner (Lee et al., 2014) or when one partner dissolves or forms another relationship

(Singh & Mitchell, 1996). Furthermore, alliances can make firms vulnerable to environmental shocks due to constraints in being able to adequately respond to a shock (Mitchell & Singh, 1996). On the other hand, inter-organizational relationships can buffer firms from external pressures, leading to a decreased failure rate (Miner et al., 1990), and indeed, relational assets have been found to be important for the survival of newly established firms (e.g., Baum, Calabrese, & Silverman, 2000; Hite, 2003; Hite & Hesterly, 2001). Finally, while the relational view extols the value of relational assets for superior performance outcomes (Dyer & Singh, 1998; Madhok & Tallman, 1998), other research finds that relational assets can, in contrast, lead to poorer performance, increased partner dependency, and constraints on resource adaptability (Anderson & Jap, 2005; Baker, 1990; Balakrishnan & Wernerfelt, 1986; Mayer et al., 2012; Poppo et al., 2008a). Thus, across both streams of literature, research findings are equivocal on the drivers of firm survival (and failure), and currently no study connects relational assets with corporate scope to examine the survival of firms.

This study seeks to fill this research gap by investigating the effects of business scope and relational assets on the survival of knowledge-based service suppliers. The connection between these two literatures (i.e., corporate diversification and the relational view) is particularly salient as the existence of suppliers is solely determined by its ability to sell knowledge-based services to clients (Maister, 1993; von Nordenflycht, 2010). Therefore, the scope of what suppliers can provide to clients, and the strategies which suppliers employ to attract, retain, and capture value from their clients are fundamental to supplier well-being.

In this study, I theorize and predict that suppliers gain survival advantages from a broader scope of client services. I also postulate that this scope-survival advantage is enhanced when suppliers dedicate a greater share of their organizational resources and attention to serving long-

term, repeated clients with whom they are more likely to build relationship-specific assets. Finally, I examine how market conditions impact supplier survival. Specifically, I maintain that when client markets are growing faster than the markets of suppliers, suppliers have greater opportunities to learn from their clients and develop new competencies. Thus greater *client market opportunities*, again, is predicted to increase the positive effect of supplier diversification on supplier survival.

I test my hypotheses using a detailed longitudinal dataset on US patent law firms and the scope of patent legal work they provide to their corporate clients. Knowledge-based services suffer from higher levels of information asymmetries and partner monitoring problems which make these services difficult to explicitly contract over (Mayer & Nickerson, 2005). Therefore, exchange relationships between suppliers and clients often depend on relational assets and more flexible, mutual forms of relationship governance for value creation (Moeen et al., 2013; Williamson, 1985). Moreover, the micro-level data available on outsourced patent projects across diverse technology industries provide an excellent real-world laboratory to test my propositions.

The current study makes a number of contributions to management literature. First, through the joint examination of how a supplier's scope strategy and relational orientation towards its clients impact supplier survival, I connect corporate-level strategy with business-level strategy. While firms' strategic actions bridge these levels of strategy, research explorations of where to compete (i.e., which markets), and how to compete (i.e., strategies and capabilities for competitive advantage), have largely developed independently. Second, by examining supplier survival as the performance outcome, I extend the nascent stream of diversification research that connects business scope to organizational mortality. In addition, this research investigation

extends the relational view by taking the theoretical and empirical level of analysis from the dyad-level to the firm-level. Third, this study contributes to and extends recent research that examines the value that suppliers can create from providing multiple services to their clients (Chatain, 2011; Chatain & Zemsky, 2007).

THEORY AND HYPOTHESES

It is well established in strategic management research that the composition of a firm's portfolio of businesses has important ramifications for firm performance (e.g., Chatterjee & Wernerfelt, 1994; Christensen & Montgomery, 1981; Palich et al., 2000; Robins & Wiersema, 1995; Rumelt, 1974; Tanriverdi & Venkatraman, 2005; Varadarajan & Ramanujam, 1987). On the one hand, this research maintains that a broader business scope allows firms to capture portfolio-level advantages over more specialized firms, such as greater resource synergies and production-based economies of scope (Panzar & Willig, 1981; Teece, 1980; 1982). On the other hand, diversified firms may fail to capture desired synergies from their business portfolio and trade at a "discount" to specialized, single industry firms (Berger & Ofek, 1995; Lang & Stulz, 1994). However, while these studies have focused primarily on antecedents of superior (financial) performance, diversification also impacts other aspects of firm performance, namely, firm survival (Bercovitz & Mitchell, 2007). Indeed, even if, as some studies suggest, diversified firms bear a "diversification discount" (Berger & Ofek, 1995; Lang & Stulz, 1994), a broader business scope also diversifies market risk (Lubatkin & Chatterjee, 1994), which may confer survival advantages.

One of the dominant lines of inquiry in the extant diversification literature is whether firms gain performance advantages when their portfolio is composed of related lines of business

(Markides & Williamson, 1996; McGahan, 1999; Miller, 2006; Rumelt, 1982). Related businesses can allow firms to create and capture higher value through greater resource sharing, efficient coordination of intra-organizational interdependencies, and the establishment of organization-wide routines. One way in which a supplier's business portfolio may be related is when they provide multiple services to the same clients (i.e., cross-selling). Cross-selling allows suppliers to build, disseminate, and embed greater levels of client-specific knowledge throughout their business portfolio (Chatain, 2011), which they can use to develop specialized routines and processes that, in turn, provide communication and coordination advantages when meeting the needs of those clients (Chatain & Zemsky, 2007). More fundamentally, cross-selling services to clients provide greater opportunities for suppliers to build relational assets, which can increase exchange value (Dyer & Singh, 1998; Madhok & Tallman, 1998) and reduce rivalry for client business (Chatain, 2011; Mayer et al., 2012). However, while both the diversification and the relational view literatures primarily focus on factors that drive performance (in the case of the relational view, relationship performance), surprisingly few studies in these research domains have addressed the issue of firm survival.

The theorizing in this study bridges the corporate diversification and relational view literatures to propose a novel framework that places business scope as a significant driver of supplier survival, but which is impacted by key relational and market mechanisms. Although some prior research has connected firm survival with corporate scope (Barnett & Freeman, 2001; Bercovitz & Mitchell, 2007; Sorenson et al., 2006; Stern & Henderson, 2004), and similarly, firm survival with inter-organizational relationships (Hoetker, et al., 2007; Lee et al., 2014; Singh & Mitchell, 1996; Uzzi, 1997), no study has considered the effect of relational assets in the context of a scope-survival relationship. Indeed, formulating and implementing strategies

that are focused on building strong ties with clients can be a critical driver of performance for suppliers, but may also decrease performance and leave suppliers vulnerable to the negative aspects of embedded relationships. Furthermore, a suppliers scope strategy (i.e., corporate strategy) and relational strategy (i.e., business strategy) are often closely intertwined (Chatain, 2011) and therefore it is valuable to understand if and how a broader business scope can provide advantages to suppliers in overcoming the potential hazards of embedded relationships, and how relational assets may enhance (or diminish) a scope-survival relationship. Finally, only limited attention has been given to examining firm survival (or failure) in the context of knowledge-based service industries[19]. This is an important gap to address as client relationships are critical assets of knowledge-based service suppliers. Thus, the mechanisms through which suppliers create and capture value (i.e., intangible services), and the competitive threats (and opportunities) that these firms face, may differ in important ways to the firms and industries that have been examined in the extant research literature.

Supplier Diversification

A broader business scope can enable firms to gain portfolio-level advantages that may not be available to narrower, more specialized firms. For example, the sharing of knowledge and resources across multiple lines of business, and developing complex routines and processes to build and exploit inter-relationships between those businesses can significantly reduce production costs and generate economies of scope (Panzar & Willig, 1981; Siggelkow, 2003; Teece, 1980). Diversified firms also have greater ability to redeploy more fungible resources, such as human capital, between lines of business should they experience resource slack in one

[19] Two studies have examined the failure of knowledge-based service firms (Phillips, 2002; Wezel, Cattani, & Pennings, 2006) but these studies are in the context of the competitive implications of interfirm employee mobility.

domain but have opportunities for business growth in another (Farjoun, 1994; Sakhartov & Folta, 2014).

While the attributes of diversified firms outlined above suggests a broader business scope may confer performance advantages (Chatterjee & Wernerfelt, 1994; Christensen & Montgomery, 1981; Robins & Wiersema, 1995; Palich et al., 2000; Rumelt, 1974; Tanriverdi & Venkatraman, 2005; Varadarajan & Ramanujam, 1987), the alternative perspective is that diversification may penalize firms as greater organizational complexity may create barriers for achieving cross-business synergies. In addition, higher operational and governance costs may offset benefits from accruing greater revenue. Research has explained these disadvantages in terms of a diversification discount that reduces profitability as firms become larger and more multifaceted (Berger & Ofek, 1995).

However, it is important to underscore that even if diversification is "profit neutral" (i.e., increased revenues through business expansion are offset by higher organizational costs), firms may still attain survival benefits. For example, diversified firms are likely to be endowed with a more diverse set of organizational routines that provide advantages when searching for solutions to strategic problems (Bercovitz & Mitchell, 2007; Sorenson et al., 2006), while these firms may hold a broader array of external ties through which they gain to superior access to new information and resources (Cohen & Levinthal, 1990; McEvily & Zaheer, 1999). Finally, diversification allows firms to reduce their exposure to the demand fluctuations of a single market (Lubatkin & Chatterjee, 1994).

Alternatively, the *process* of diversification can stretch organizational resources, increasing the risk of firm failure, especially if firms expand too rapidly (Barnett & Freeman, 2001). Indeed, Bercovitz and Mitchell (2007) note that diversified firms are most vulnerable to

failure when they over-diversify and cannot refocus sufficiently to eliminate spare capacity. Prior research has also noted that expansion into less related markets can reduce firm survival due to unfamiliarity with the market and barriers to creating cross-business synergies (Sorenson et al., 2006).

Knowledge-based service suppliers may have important advantages over firms in other industries, particularly manufacturing, when it comes to increasing business scope. First, because these suppliers are human capital intensive, they are able to dynamically adjust their resource capacity in line with their cost-base, essentially by hiring new talent to capture more business or releasing under-utilized talent back into the labor market. Second, diversification for these firms arguably entails less financial risk as suppliers are not typically required to make substantial sunk-cost financial investments in specialized resources (e.g., a new manufacturing plant). Indeed, suppliers can diversify simply through the strategic hiring of new talent or merging with another supplier. Third, the emerging needs of existing clients can be an impetus for supplier diversification (Mawdsley & Somaya, 2015), lowering the risks of expansion through greater cross-selling opportunities (Chatain, 2011; Klemperer, 1992; Siggelkow, 2003).

Taken together, a broader business scope confers portfolio-level benefits of strategic flexibility, increased revenues, reduced production costs through economies of scope and efficient resource redeployment, and diversification of risk, while also allowing suppliers to provide greater value to clients (Chatain & Zemsky, 2007). I therefore maintain that, consistent with prior literature (e.g., Bercovitz & Mitchell, 2007; Sorenson et al., 2006), these diversification benefits provide suppliers with significant survival advantages relative to suppliers with a narrow scope. Accordingly, I offer the following hypothesis:

H1: The greater the level of supplier diversification, the greater the probability of survival for that supplier.

Long-Term Clients

In contrast to arms-length, discrete-transactional exchange relationships (Macneil 1980), long-standing, embedded relational ties between suppliers and clients have the potential to deliver superior performance (Dyer & Sing, 1998; Madhok & Tallman, 1998). For example, suppliers holding deeper levels of client-specific knowledge can meet their client's needs with greater precision (Asanuma, 1989; Chatain, 2011; Levinthal & Fichman, 1988), while the building of client-specific resources and knowledge transfer routines can provide communication and coordination advantages in service delivery (Ring & van de Ven, 1994; Zollo et al., 2002). In addition, inter-organizational trust developed over a longer transactional history (Gulati, 1995) facilitates inter-organizational learning and lowers relationship governance costs (Dyer & Chu, 2003; Macneil, 1980; Williamson, 1985; Zaheer & Venkatraman, 1995; Zaheer et al., 1998). Unsurprisingly, extant research finds these relational advantages often cement exchange relationships (Chatain, 2011; Mayer et al., 2012) and provide suppliers with longer-term survival benefits (Hoetker et el., 2007).

However, other research suggests that relationship duration alone is not sufficient to generate relational advantages (Poppo, et al., 2008a). Rather, the potential opportunity costs from relationship dissolution are deemed at least as critical for aligning partner incentives for cooperation and reducing behavioral uncertainty (Axelrod, 1984; Vanneste & Frank, 2013). Moreover, suppliers who focus on building and maintaining existing client relationships, relative to gaining new clients, risk over-committing resources and becoming disproportionately

dependent on those clients for future business (Sorenson & Waguespack, 2006). Dependency can increase the risk of client opportunism due to asymmetric power in the relationship (Baker, 1990; Pfeffer & Salancik, 1978) and a lower alternative use value for client-specific resources (Klein et al., 1978), thereby exposing suppliers to the hazards inherent in small numbers competition (Williamson, 1975). Furthermore, prior studies show that the probability of relationship dissolution can *increase* with relationship duration owing to client needs evolving away from supplier expertise (Levinthal & Fichman, 1988; Seabright et al.,1992), while greater partner dependency can lead to firm failure when assets (i.e., client new business) accessed through a partner are critical for survival (Lee et al., 2014; Sheppard, 1995). Indeed, the failure of the large US corporate law firm Heller Ehrman in 2008 was, in part, a result of the failure of financial institutions Washington Mutual and Lehman Brothers who Heller depended on for large fraction of its client business. Therefore, although suppliers may capture value through a portfolio of long-standing clients, there are also potential vulnerabilities that can impact their survival.

A broader business scope may provide suppliers with the ability to effectively manage vulnerabilities and capture the advantages from a portfolio of relationally embedded exchange relationships and, in turn, enhance the survival benefits from being more diversified firms. At a basic level, greater cross-selling opportunities can not only increase the revenues of suppliers, but also allows the establishment of multiplex ties (Rogan, 2014a) and the building of relational assets with clients (Chatain, 2011), which stabilize exchange relationships. Supporting these economic bonding effects, broad-based suppliers can create greater value through the dissemination and embedding of client-specific knowledge, allowing for the superior identification and management of client-related interdependencies (Argyres & Zenger, 2012;

Milgrom & Roberts, 1995; Moeen et al., 2013) and the generating of *client-specific* economies of scope (Chatain & Zemsky, 2007).

The benefits to diversified suppliers from holding a portfolio of long-term clients are consistent with the extant diversification literature that maintains firms can gain advantages from a portfolio of related businesses (Christensen & Montgomery, 1981; Rumelt, 1974). While firm expansion may entail greater levels of managerial attention and operational costs to coordinate and manage complex independencies across business areas (Berger & Ofek, 1995; Kogut & Zander, 1993; Penrose, 1959), a portfolio of long-term clients can allow suppliers to draw on existing stocks of knowledge and resources to capture greater cross business synergies (Chatterjee & Wernerfelt, 1994; Markides & Williamson, 1994; Tanriverdi & Venkatraman, 2005). Finally, a portfolio of long-term clients can buffer suppliers from the risks of the diversification process itself. Expanding at a rapid rate and/or into more distant markets poses significant failure risks for firms (Sorenson et al., 2006) due to greater adjustment costs (Helfat & Eisenhardt, 2004) and uncertainty associated with entering new markets. Drawing from long-term clients and maintaining a stable flow of revenues may reduce some of these diversification hazards, particularly as recent research shows that suppliers often diversify in response to diversification in the needs of their relationally embedded clients (Mawdsley & Somaya, 2015).

In summary, suppliers who dedicate a greater share of their resources to serving long-term clients have the potential to gain relational advantages, but also risk being exposed to relational hazards associated with over-commitment of resources and greater exchange partner dependency. I maintain that a broader business scope provides suppliers with the ability to dynamically manage their business portfolio to mitigate these potential hazards and realize

relational advantages, in turn, enhancing the survival benefits suppliers gain from diversification. I therefore provide the following hypothesis;

> *H2: The greater the fraction of business in a focal supplier's business portfolio that is from long-term clients, the stronger the effect of supplier diversification on the probability of survival for that supplier.*

Client Market Opportunity

Attributes of the markets within the supplier's business portfolio impact the level of supplier value creation and value capture. Rapidly growing, more innovative markets may provide greater revenue opportunities advantages through munificent market (i.e., client) demand and cost advantages through the ability to re-use scalable resources (Levinthal & Wu, 2010). However, they also require suppliers to maintain strategic and market flexibility by continually updating their capabilities in line with market advancements and ensuring their service offerings are competitive for a broad client base (Balakrishnan & Wernerfelt, 1986; Eisenhardt & Martin, 2000; Teece et al., 1997). In contrast, stable, less innovative markets are more favorable to creating value from committed exchange relationships and the building of relational assets (Ghemawat & del Sol, 1998; Moeen et al., 20130), but can increase the risk of strategic inertia and resource obsolescence. However, the range of services that suppliers offer may not meet all the needs of their clients (Moeen et al., 2013), but the attributes of supplier markets compared to the markets of their clients may have important implications for supplier outcomes.

When *clients* have a greater presence in more innovative markets, relative to the suppliers they use for some of their outsourced work, suppliers in less innovative markets are at greater risk of their knowledge base becoming out of step with their clients' needs. Lacking the

absorptive capacity to recognize and assimilate information from these innovative markets (Cohen & Levinthal, 1990), and with learning often following a path dependent process that is linked to existing resource stocks (Chang, 1996; Nelson & Winter, 1982), there is a greater probability that these exchange relationships will dissolve as clients seek a stronger resource-fit with alternative suppliers (Seabright et al., 1992). Suppliers may therefore be *dis*advantaged in their ability to attract and retain more innovative clients, in turn negatively impacting their ongoing competitive position. However, the private sharing of knowledge between relational partners is often an important conduit for organizational learning and the building of new competencies (Doz, 1996; Gulati & Gargiulo, 1999; Hamel, 1991; Kale et al., 2000; Khanna, Gulati, & Nohria, 1998; Larsson et al., 1998; Mowrey, Oxley, & Silverman, 1996; Simonin, 1999; Uzzi & Lancaster, 2003). Thus, suppliers can gain learning advantages from serving more innovative clients, and, moreover, clients may be more willing to share information and increase supplier learning if it enables the supplier to provide higher added value (compared to alternative suppliers) in their service provision. Therefore, in meeting at least some of the needs of innovative clients, less innovative suppliers may be able to overcome some of the vulnerabilities from serving those clients and increase their potential for capturing greater value.

Suppliers with a greater presence in higher-paced, innovative markets, relative to their clients, may be following a strategy in which they are focused on more profitable demand opportunities. Yet, by concentrating more heavily on innovative markets, suppliers may focus less on client retention and, therefore, compete more intensely with rival suppliers for client new business. Although suppliers with superior capabilities are more likely to achieve and maintain competitive advantages (Barney, 1991; Peteraf, 1993), suppliers holding relatively lower quality capabilities may be more vulnerable to failure (Harper, 2013). This latter possibility may be a

distinct risk for suppliers who serve less innovative clients as they may not be able to capture the same learning benefits as those highlighted above. In addition, the negative impacts may be strengthened by the signal that suppliers are conveying to the market (Greenwood et al., 2005). Anecdotal evidence suggests that clients often pay close attention to who suppliers serve when selecting an outsourced partner as this is one mechanism through which clients can gauge supplier quality (Coates et al., 2011). More specifically, a lack of innovative clients within a supplier's portfolio of business may impede their ability to establish new client relationships. Thus, while suppliers have the possibility to capture advantages from providing services in markets that are more innovative than the majority of their clients' needs, they are also potentially vulnerable to disadvantages that could impact their competiveness, and in turn, survival.

I maintain that the business scope of suppliers is an important determinant for whether they can gain survival advantages or become exposed to survival hazards. Suppliers who are more specialized (i.e., a narrower scope) may be more vulnerable when serving more innovative clients. With fewer lines of business to buffer the potential loss of clients, suppliers may suffer greater penalties from holding resources that are less relevant to the needs of innovative clients. In addition, these suppliers have fewer conduits into the market through which they can gain learning advantages from innovative clients, thereby constraining their ability to build absorptive capacity and develop new capabilities. However, suppliers with a broader business scope increase their opportunities for accessing a wider array of new knowledge and building absorptive capacity. Furthermore, suppliers have the potential to meet multiple service needs of innovative clients, which increases client switching costs and, in turn, allows suppliers to gain learning advantages over a prolonged period. A broader scope and greater learning opportunities

may also be valuable for suppliers to identify important complementarities and interdependencies between different lines of business. This can enable suppliers to increase their value proposition to clients by providing services that bridge technology classes and support the more innovative lines of business in which their clients predominantly compete. Finally, a broader scope also increases the potential that suppliers will have at least some presence in these faster-paced markets, which reduces the risks of resource obsolescence and provides access to forming relationships with new, innovative clients.

Suppliers who are more innovative than their clients may also be particularly vulnerable to failure when they are narrow in scope. First, they are exposed to market risk and, second, they may have disadvantages in attracting the type of clients (i.e., innovate, faster growing) that would allow them to grow their business and compete successfully in those markets. A broader scope diversifies market risk, but may also allow suppliers to gain additional advantages through developing relational assets with these clients. Prior research studies have shown that clients in more stable markets prefer to concentrate their business into few suppliers and create value through building relational assets (Moeen et al., 2013). A broader scope would provide suppliers with greater opportunities to develop deeper relationships and retain these clients, thus decreasing survival vulnerability and providing another avenue for value creation. Accordingly, I present the following hypothesis:

> *H3: The greater the growth in the markets of (a supplier's) clients relative to growth in the markets of the supplier (client market opportunity), the stronger the effect of supplier diversification on the probability of survival of that supplier.*

SAMPLE & METHODS

I tested my predictions using a longitudinal panel dataset of patent law firms (suppliers) and their corporate clients (buyers). I used the official patent attorney roster published by the Office of Enrollment and Discipline (OED) of the US Patent and Trademark Office (USPTO) to identify my sample of patent law firms. The register contains the name, employer and unique registration code for each patent attorney admitted to the US patent bar, and is continually updated to include new patent attorneys and account for inter-firm mobility of patent attorneys. For any point in time, the number of registered patent attorneys can be identified for each supplier. My supplier sample comprised of all US patent law firms with at least five registered patent attorneys in 1990, which after accounting for firms with missing data, was 214 firms.

I used outsourced patent legal projects that were filed to (and granted by) the USPTO to examine relationships between patent law firms and their clients. Each patent is an individual legal project representing a transaction between the client and the supplier. Each patent application provides the client, law firm (or name of in-house patent attorney) who prosecuted the patent, and the specific technological domain of the patented invention. Using the detailed information contained within patent applications, for each year I created fine-grained patent portfolios for every law firm and client firm in my sample, and used these portfolios to construct longitudinal transactional histories between law firms and their clients. To identify patents outsourced to my sample of patent law firms, I used multiple search algorithms on each law firm name to search in the "Attorney or Agent" field on the patent application. Including extra years for variable construction (1986-1989), between 1986 and 2000, I identified a core sample of approximately 509,000 patents outsourced to my sample of 214 suppliers from roughly 61,000 unique clients.

Dependent Variable

Supplier Survival: The dependent variable in this study is supplier survival, which was coded as 1 in year t if the focal supplier survived the following year. A "failure" (coded as zero) is entered in year t if the supplier exited the sample completely or dropped below five registered patent attorneys (without recovering again in the observation period to at least five attorneys) in year t+1. Knowledge-based service firms can fail for a number of reasons, such as bankruptcy deliberate dissolution of the firm, or merger and acquisition. Data limitations meant it was not possible to identify the cause or symptom of failure. However, checks of company histories were undertaken to identify if "failed" suppliers had been acquired, and to determine, where possible, that failed firms had actually dissolved[20]. Following these checks, 12 initial failures were recoded as having survived (and therefore treated as censored), resulting in 56 failures from 214 suppliers and 1750 firm-year observations.

Independent Variables

Supplier Diversification: To calculate the business scope for each of my sample of supplier firms, I exploited the nested structure of the International Patent Class (IPC) system (similar to the Standard Industry Classification (SIC) system) and computed supplier diversification using the entropy index (Palepu, 1995), which is commonly employed in management studies as a measure of diversification (e.g., Lee & Kim, 2014; Markides, 1995;

[20] The treatment of merger and acquisitions (M&A) in studies of survival (or failure) may vary across literature. At a basic level, firms may exit the sample because they have been acquired by another firm. On the one hand, this may represent a failure in the sense that the acquired firm ceases to exist, and may have been acquired at a discount if it was struggling. On the other hand, an acquisition may represent a success for the acquired firm, particularly if the strategic goal was to be acquired by a larger firm. In knowledge-based services, M&A are rife and often this has little relationship with a "failure". Importantly, the treatment of an acquired firm (i.e., failure or censored observation) may have a bearing on empirical findings of prior studies of firm survival. In this study, I follow recent studies in knowledge-based services and treat acquired suppliers as censored and *not* as having failed (Bermiss & Murmann, 2014).

Robins & Wiersema, 2003). The IPC system has the advantage of sharply defined technology (patent) classes through which the scope of the firm can be cleanly identified. However, the IPC system treats all patent classes as orthogonal (unrelated), when in reality they may be related. The entropy measure is attractive as it accounts for relatedness between lines of business (Palepu, 1985; Robins & Wiersema, 2003), thus mitigating any potential bias from non-orthogonal (i.e., related) patent classes. The entropy measure of diversification is given as;

$$Supplier\ Diversification_i = \sum_{k=1}^{N} P_{ik} \ln(\frac{1}{P_{ik}})$$

where P_{ik} is the share supplier *i*'s patents of the *k*th 4-digit IPC[21] (of *N* IPCs) in the total patent portfolio of the supplier over the prior three years. Each IPC share was weighted by the relative importance of that IPC in the supplier's patent portfolio, where the weight is the logarithm of the inverse of its share. Palepu (1985) provides a derivation in which it is shown that the expression above consists of two elements; related diversification (DR) and unrelated diversification (DU), and that total diversification (DT) is the sum of DR and DU.

Long-Term Clients: To compute the extent to which suppliers focus their business on serving long-term, repeated clients relative to new or ad-hoc clients, for each year (starting in 1986) I constructed supplier-client dyads where each dyad match was identified as a client having outsourced patent legal work to the focal supplier in that year. Then, for each supplier in each year, I calculated the fraction of patents in their business portfolio accounted for by clients they provided serves to in each of the previous five years.

[21] For example patent class B41G can be thought of a B/41/G, where B is 1 digit, B41 is 3 digit, and B41G is 4 digit.

Client Market Opportunity: The extent to which clients operate in faster-paced markets than suppliers (or vice-versa) was computed as the difference in the growth of IPCs within the business portfolios of a supplier's clients, and the growth of IPCs within the same supplier's business portfolio. Using the universe of patents applied to, and granted by, the USPTO, I calculated a running three-year log-growth in the number of patents in each 4-digit IPC technology domain, and used these IPC growth rates to compute separate measures for "client market growth" and "supplier market growth". Specifically, *Client Market Opportunity* is calculated as[22];

$$Client\ Market\ Opportunity_{it} = \sum_{j=1}^{n}\left[\left(\sum_{k=1}^{n} P_{jkt}\right) * N_{ijt}\right] - \sum_{k=1}^{n} N_{ikt}$$

where P_{jkt} is the three-year log-growth of patents in each IPC *k* weighted by the three-year fraction of client *j* patents in IPC *k*, N_{ijt} is the three-year fraction of client *j* patents accounted for in supplier *i*'s business portfolio, and $N_{ikt}$is the three-year share of supplier *i*'s patents in each IPC *k*.

Control Variables

Market Volatility: The number of patents issued annually for the previous 3 years (including the focal year) was regressed on the year variable. The standard error of the regression coefficient was then divided by the three year mean of patents in each 4-digit IPC (Kor, Mahoney, & Watson, 2008; Sharfman & Dean, 1991; Wang & Chen, 2010). Finally, IPC-volatility figures where weighted by the three-year fraction of supplier patents across IPCs, and

[22] Where the first term is client market growth and the second term is supplier market growth.

then aggregated to portfolio level. *Client Distance* is computed as the Mahalanobis Distance (MD)[23] between the patent vector of a focal supplier, and the weighted outsourced patent vector of that supplier's clients. The MD calculates the share of their clients' business suppliers are able to capture. *Supplier Size* is computed as the number of patent attorneys registered as being employed at a supplier in the focal year. *Domain Expertise* is measured as the three-year share of non-prior art citations (such as citations to academic publications and research presentations) among all citations in a supplier's patent portfolio. A higher share of non-prior art citations is an indication that a supplier builds more on specialized scientific knowledge relative to practical inventions (Cassiman et al., 2008). *Occupational Expertise* is calculated as the percentage of patents in the supplier's prior patent work that cite a previously litigated patent. Such patents are themselves about six times more likely to be subject to litigation than an average patent (Mayer et al., 2012) and clients are more likely to seek superior legal competence to prosecute these patents in case they are later contested in the courts. *Client Size:* The average size of a supplier's clients is proxied as the total level of innovation from clients within a supplier's portfolio. For each year, I calculated the number of patents obtained by each client and weighted those patents by the fraction of a supplier's business accounted for by that client in the previous three years, before aggregating to compute a weighted average measure of client innovation for each supplier. *Outsourced Patents* is the number of patents outsourced by each client to a focal

[23] The MD is calculated as; $MD = \sqrt{(S_{it} - C_{Jit})^T W^{-1} (S_{it} - C_{Jit})'}$ where W^{-1} is the inverse of the pooled covariance matrix. The supplier vector, S_i, was calculated as the fraction of each supplier's patents across 4-digit IPCs in a particular year *t*, while the client vector C_{Ji} is the aggregated share of patents in each IPC outsourced by clients of the focal supplier. Each individual client IPC-share was weighted by the three year fraction of supplier business accounted for by that client, whereby greater weight in the measure is given to clients served more frequently by suppliers. The MD has a critical advantage over the Euclidean Distance (ED) -- which is an alternative distance measure used extensively to calculate differences between organizations -- in that the MD accounts for correlations between dimensions. In other words, by taking into account the correlation-covariance matrix, the MD considers underlying similarities between IPCs as well as the mean differences between the portfolios of suppliers and clients (Kim & Finkelstein, 2009; Kumar, Mahalanobis, & Juday, 2006).

supplier, which, again, is weighted by the three-year fraction of that suppliers' total business accounted for by those clients before aggregating across all clients in the supplier's portfolio.

Econometric Model

I tested my hypotheses using discrete-time survival analysis techniques. Discrete time survival analysis treats time not as a continuous variable, but as partitioned into discrete periods. In this study, each discrete-time period was represented by one year. Logistic models are particularly well suited to discrete-time survival estimation (Allison, 1984), particularly when the explanatory variables are taken in multi-year intervals (Bermiss & Murmann, 2014). For estimation, I employed a logit model which uses binary variables as survival indicators and calculates coefficients using logistic probabilities. A link test (Pregibon, 1979) confirmed my estimated model was correctly specified and that no relevant variables had been omitted. The data were organized in yearly cross-sectional panels, and the interest was in understanding between-firm rather than within-firm differences. Specifically, I estimated the probability of supplier firm survival in year t+1, conditional on surviving to year t. To account for potential heteroskedasticity and non-independence of residuals within groups, I used robust standard errors that were clustered by supplier. My results are also robust to using a complementary log-log specification, which fits a discrete-time proportional hazard model, similar to a discrete-time Cox model (Prentice & Gloeckler, 1978).

RESULTS

Tables 4.1 and 4.2 report the summary statistics and correlation matrix. A Variance Inflation Test shows that multicollinearity is not a factor in my model. The mean VIF value was

1.42 with the highest VIF value at 2.22.

Table 4.3 presents the coefficients from the main logit models, wherein Model 1 reports control variables only. Model 2 tests hypothesis 1 which predicted a positive relationship between supplier diversification and supplier survival. The coefficient of *Supplier Diversification* is positive and significant at the 1% level, providing strong statistical support for H1. Figure 4.1 graphically presents the predicted probability of supplier survival at different levels of supplier diversification, while Figure 4.2 presents the marginal effects for this hypothesis. Both Figures 1 and 2 corroborate H1.

Model 3 in Table 4.3 presents results for hypothesis 2, which predicted that a greater fraction of a supplier's new business accounted for by long-term clients strengthens the positive relationship between supplier diversification and supplier survival. The coefficient of the interaction of *Supplier Diversification*Long-Term Clients* is positive and significant at the 5% level, thus supporting H2. However, the interpretation of interaction effects in non-linear models cannot be determined through the coefficient alone (Hoetker, 2007). Unlike linear models, the marginal effect of a change in both interacted variables is not equal to the marginal effect of changing just the interaction term (Norton, Wang, & Ai, 2004). Moreover, both the sign and statistical significance may vary across observations (Huang & Shields, 2000) and, therefore, statistical significance cannot be determined from the z-statistic on the regression output (Norton, Wang, & Ai, 2004). To address this, scholars have recommended plotting the interaction effect for each observation and then identifying the range of values on which the interaction effect is statistically significant[24] (Ai & Norton, 2003; Norton, Wang, & Ai, 2004). Figures 4.3 and 4.4 provide this interpretation. Figure 4.3 plots the interaction effect of *Supplier Diversification*Long-Term Clients* for each observation in Model 3. We see indeed that the

[24] This is computed in Stata using the user-written *inteff* command from Norton, Wang, and Ai (2004).

signs of the interaction effects vary within the model; however, the mean interaction effect is positive. Figure 4.4 plots the z-statistic for each interaction effect and it is observed that the range in which the interaction effect has a statistically significant positive impact on supplier survival is between 0.6 and 0.85, corroborating H2.

Model 4 in Table 4.3 tests hypothesis 3, which predicted greater growth in client markets relative to supplier markets positively moderates the effect of supplier diversification on supplier survival. The coefficient is positive and significant at the 1% level, supporting H3. Figures 4.5 and 4.6 plot the interaction effects and z-statistics, respectively. As with H2, we note in Figure 4.5 that the signs of the interaction effects for H3 in Model 4 may be both positive and negative, although the mean interaction effect is negative, which is contrary to the prediction of H3. However, we observe in Figure 4.6 that the observations which have a statistically significant impact on the probability of supplier survival have a positive sign, as predicted by H3. Overall, the findings corroborate the predictions made in the current study.

Additional Analyses

A number of additional analyses were performed to determine the robustness of the main results, and these tests are reported in Appendix C. First, an alternative to the entropy index used in this study is the concentric index (Caves, Porter, & Spence, 1980; McGahan, 1999; Montgomery & Hariharan, 1991; Montgomery & Wernerfelt, 1988). Like the entropy index, the concentric measure accounts for relatedness between lines of business and I ran the main logit models from Table 4.3 again with the concentric index as the dependent variable. These alternative results corroborated H1 and H3 of the main findings, but is statistically a much weaker fitting model (comparing the full models; using the concentric diversification measure

yields a BIC' = -15.275 and McFadden's R-squared =0.362 compared to a BIC' of -91.371 and a McFadden's R-squared of 0.516 when using the entropy diversification measure). Second, I tested an alternative time specification of three years (rather than five) to examine the impact of long-term clients on the supplier diversification-supplier survival relationship. I found in this case, H2 is not statistically significant, suggesting that suppliers may only reap survival benefits from enduring relationships once those relationships have passed a certain duration threshold. Third, the current study examines suppliers who provide specialized patent legal services. However, suppliers in my sample that provide legal services beyond patent work (e.g., large, broad-based corporate law firms) are likely to gain survival advantages through being the "patent arm" within a larger firm. While data limitations meant that I could not identify the full scope of legal services provided by my sample of suppliers, 24 suppliers were included in the annual National Law Journal (NLJ) rankings of the largest, and typically highly diversified, 250 US corporate law firms. To check if my findings were being driven by these large suppliers, I removed them from the sample and ran the main models again. The main results were corroborated using this smaller sample of suppliers. Finally, while the logit model was an appropriate specification for the analyses in the present study, my results are also robust to the alternative specification of a complementary log-log model. Taken together, the additional analyses provide confidence in the robustness of the research findings presented in this study.

Limitations

While the findings of the current study provide contributions to the literatures in corporate diversification and the relational view, this study is not without limitations. The first limitation is the context of patent legal services. While the theorizing and findings are likely

generalizable across other contexts in knowledge-based services, they may be less applicable to manufacturing industries or other industries where critical assets are less fungible across lines of business, and where the implementation of diversification strategies involves significant up-front financial sunk costs and greater risk.

The second, related, limitation, is the examination of supplier-client relationships. Serving clients and building relational ties is of fundamental strategic importance to suppliers. However, it is less clear whether the theorizing and findings of this study would be relevant for other forms of inter-organizational relationships, such as horizontal strategic alliances. For example, while partner-specific absorptive capacity has been cited as being an important mechanism for knowledge transfer and understanding the business of the partner firm (Zahra & George, 2002), it is unclear whether alliance partners with a greater resource overlap would be more or less likely to survive through forming their alliance.

A third limitation concerns the factors that lead to supplier failure. In knowledge-based service firms, the downward spiral leading to failure can manifest relatively quickly and is often linked to a drop in revenues and a subsequent decrease in the pool of firm profits that are distributed between firm manager-owners ("partners"). When revenues are down, these firms are at risk of their key revenue makers defecting to a rival, which can have a pied-piper effect of other employees following, weakening the firm. Data limitations meant that financial results were not available for my sample of suppliers, which would have allowed detection of a declining revenue position over time. However, as employee exit can be closely linked to poorer financial performance, the control variable *Employee Turnover* is a suitable proxy. Unsurprisingly, we observe across most models in Table 4.3 that a higher level of *Employee Turnover* reduces a supplier's probability of survival.

Suppliers with a higher market reputation for quality are likely to have a survival advantage as these suppliers are better able to attract and retain high caliber clients and talent (Greenwood et al., 2005). Indeed, prior empirical findings reveal that higher firm reputation can significantly increase a supplier's financial performance (Greenwood et al., 2005). However, and the final limitation considered here, this study lacks a direct measure for supplier reputation. This lack of a direct measure for supplier reputation could be problematic if reputational effects, as can be reasonably expected, have an important bearing on supplier survival. I do, however, feasibly address this concern through other mechanisms. First, suppliers gain a positive reputation through having superior competencies which creates high value for clients. The inclusion of variables that control for a supplier's domain expertise and occupational expertise directly address how competent a supplier is in terms of knowledge of a client industry (i.e., *Domain Expertise*) and knowledge of patent and litigation law (i.e., *Occupational Expertise*). We note in Table 4.3 that greater *Domain Expertise* and *Occupational Expertise* increase the probability of supplier survival. Second, those suppliers included in the NLJ 250 are likely to have a higher reputation than suppliers not included. Yet, as noted above, the main findings in this study do not change when these suppliers are removed from the sample. Therefore, I submit that the control variables included in the main models, together with the additional analyses discussed, mitigate this data limitation.

Notwithstanding these limitations, the current study provides a number of contributions to extant literature, which I discuss next.

DISCUSSION

Drawing from strategy research on corporate diversification and the relational view, this study examined how the scope of client services offered by knowledge-based service suppliers

impacted the survival of those firms. Using a sample of patent law firms (i.e., suppliers) I found strong statistical support for the baseline prediction that a broader scope of services increases the probability of supplier survival (hypothesis 1). This study, thus, contributes to nascent research that examines how firm scope impacts firm survival (e.g., Barnett & Freeman, 2001; Bercovitz & Mitchell, 2007; Sorenson et al., 2006; Stern & Henderson, 2004), though this study is distinct in that it is the first to examine the diversification-survival relationship in a human capital intensive industry, and moreover, is the first study to investigate the moderating impact of vertical exchange relationships on the efficacy of horizontal business scope for firm survival advantages.

Knowledge-based service suppliers exist solely to provide services to clients. Consequently, prior research and practitioner evidence extol the importance of strategies for capturing new business and maintaining client relationships (Bower, 2014; Chatain, 2011; Maister, 1993; Mawdsley, 2015). Specifically, one critical concern for managers is the extent to which they should channel firm resources towards sourcing greater levels of new business from their existing clients. While focusing on serving existing clients can provide advantages in terms of a more stable revenue stream (Chatain, 2011), the trade-off to such an approach is a decreased focus on capturing new clients from the market, which in turn, can negatively impact organizational learning (Uzzi & Lancaster, 2003). Therefore, due to the criticality of clients to the well-being of suppliers, an appropriate examination of the performance impacts of a supplier's business scope should also consider the supplier's relational, or demand-side, strategy (Adner & Zemsky, 2006; Priem, 2007).

Accordingly, I bridged literatures on corporate diversification and the relational view, and connected corporate-level strategy with business-level strategy, by examining the moderating effect of a supplier's relational strategy – specifically, the extent to which a

supplier's focus their business on serving long-term clients -- on their scope-survival relationship. Prior research suggests long-term exchange relationships can lead to potential *dis*advantages for suppliers, such as knowledge obsolescence (Anderson & Jap, 2005), increased resource dependency (Sorenson & Waguespack, 2006; Sheppard, 1995), and reduced market focus (Lazzarini et al., 2008). Moreover, long-term relationships may, in fact, be at a greater risk of dissolution due to evolving client requirements which can weaken the resource-fit between suppliers and clients (Levinthal & Fichman, 1988; Seabright et al., 1992). Dissolution of long-standing client ties can be hazardous for suppliers due to having likely accumulated significant levels of specialized resources (Argyres & Zenger, 2012) that hold less value for alternative clients (Klein et al., 1978). However, the finding that suppliers can *increase* the positive survival effect from having a broader scope when their business portfolio does, in fact, comprise of relatively more business from long-term clients (hypothesis 2) reveals an important condition under which suppliers can gain advantages from bonding themselves more strongly to, and increasing dependency on, their clients. Thus, this study showed that suppliers can gain relational advantages when implementing strategies that enable them to meet more needs from existing clients (as opposed to new clients). In meeting more needs of these long-term clients, suppliers can develop internal routines and processes that more effectively manage client interdependencies, while the dissemination of client-specific knowledge across more lines of business enables suppliers to more precisely meet the needs of those clients. Moreover, by creating multiplex ties (Rogan, 2014a), suppliers are able to increase the economic bonding with clients due to greater client switching costs of using an alternative supplier (Williamson, 1985). Another implication for suppliers who hold a portfolio of embedded client relationships is that it may allow suppliers to be more risk averse in their strategic formulations, which may have

particular advantages for survival[25]. Therefore, with this finding I also contribute to and extend recent research that examines how suppliers can derive economic benefits when providing multiple services to clients (Chatain & Zemsky, 2007; Siggelkow, 2003), and how these service offerings increase relationship stability and preserve future relationship value (Chatain, 2011). I also extend the relational view by revealing how a supplier's business scope strategy interacts with its relational strategy to deliver positive performance outcomes.

The current study also investigated the effect of market conditions on the efficacy of supplier diversification for supplier survival. Controlling for the volatility of markets within a supplier's portfolio of businesses, the finding that greater growth in the markets of clients, relative to markets of suppliers (hypothesis 3), underscores the importance of innovative exchange partners as mechanism for organizational learning. Indeed, a broader business scope increases the channels through which suppliers can gain new knowledge from innovative clients that provide greater opportunities for suppliers to build new competencies, and identify complementarities between their businesses and the businesses of their clients.

The relational view primarily focuses attention on factors specific to exchange relationships, such as inter-organizational resources and capabilities and mutual forms of relationship governance, while often paying only cursory attention to the environment in which exchange relationships occur. Therefore, I extend the relational view by revealing the contextual importance of a client markets to supplier performance. I also contribute to nascent research that establishes a link between market conditions and a firm's diversification-survival relationship

[25] This point is illustrated by the contrasting experiences of corporate law firms Coudert Brothers and Clifford Chance. US-based Coudert Brothers were the first truly international law firm, and their overseas expansion initially gave them a competitive advantage. However, Coudert lacked an embedded portfolio of clients which they could rely on for business, and their overseas offices were unprofitable. Coudert were soon overtaken by rivals, including UK-based Clifford Chance who had a portfolio of deep and lasting relationships with lucrative investment banking clients who they could leverage as part of a lower risk strategy for expanding into foreign markets. While Coudert failed in 2006, Clifford increased their profitability and strengthened their position as one of the preeminent UK law firms (http://www.nytimes.com/2005/08/30/business/30law.html?pagewanted=all).

(e.g., Stern & Henderson, 2004). However, while Stern and Henderson (2004) examined market effects in the context of competitive (i.e. rivalrous) inter-organizational relationships, my approach considers the effects of markets within cooperative inter-organizational relationships.

The findings in this study offer a number of opportunities for future research. First, while the present study offers insights into the performance advantages of serving long-term clients, future research may examine the extent to which suppliers focus their strategies on meeting *more* of their clients' needs and capturing a greater share of their clients' business – in other words, how closely does the service scope of suppliers mirror or overlap with the overall demand from their portfolio of clients. For example, one recent study (Mawdsley & Somaya, 2015) finds that suppliers are more likely to diversify their business scope in response to scope changes by their clients, and this diversification effect is driven by their underpinning relational assets. Building on this, researchers may investigate the drivers which increase or decrease the portfolio overlap between suppliers and clients. In this vein, Table 5 offers one potential avenue for exploration. Using *Client Distance* as the dependent variable, a random effects OLS regression reveals that while greater supplier diversification is not necessarily a strong predictor of scope overlap (as shown by the insignificant coefficient on *Supplier Diversification*), suppliers with a portfolio comprised mainly of business from long-term clients do, on average, have greater scope overlap with their clients. However, when client markets are growing more rapidly than supplier markets, there is less overlap between suppliers and clients, and when suppliers have superior domain and occupational expertise (and therefore are less likely to build relational assets with clients).

Another avenue for future research is to test my theory and predictions in a context outside of legal services. Typically, law firms do not extend significantly, if at all, beyond areas

of legal practice. Other types of knowledge-based service firms are, however, noted for having branched out beyond their core offerings. For example, large accounting firms (e.g., KPMG) diversified into business advisory services in order to offer more services to clients, and, moreover, these diversification strategies were in response to both the recognition that clients required more services than those suppliers currently offered, and that globalization of clients offered rich opportunities for new business acquisition. Indeed, examining geographic diversification as well as service diversification could provide an interesting research opportunity, not least because it has been noted in prior studies that relational assets can increase firm performance when firms expand internationally (Hitt et al., 2006). Thus, can suppliers gain even greater advantages from aligning both their geographic and service footprint with clients, or would this strategy bring significant constraints and lead to relational disadvantages?

Finally, previous research outlines the hazards associated with increased dependency on exchange partners for critical resources (Baker, 1990; Lee et al., 2014; Sheppard, 1995). In the present study, long-term clients on which suppliers may feasibly be dependent upon for new business are found to confer survival benefits when that supplier has a broader scope. However, the present study did not investigate contingencies in which dependency may impact these positive results. For example, if clients can exercise power over suppliers, can suppliers still reap relational advantages? Could suppliers diversify their scope away from clients if they become too dependent and started to suffer performance disadvantages? However, the resolution of these questions, and those noted earlier, must await future research.

In summary, the research findings in the present study make important contributions to the strategic management field by highlighting that, while suppliers can improve their survival chances from holding a broader scope of client services, strategies for maintaining long-term

client relationships have an important bearing on the effectiveness of diversification for survival. In addition, market conditions in the lines of business that suppliers and clients operate also significantly influence the scope-survival relationship. I encourage scholars to use this study as a platform to further develop the conversation on connecting business scope with inter-organizational relationships.

TABLES AND FIGURES

Table 4.1: Summary statistics of key variables

Variable	Mean	S.D.	Min	Max	Between S.D.	Within S.D.
Supplier Diversification	3.46	0.82	0.63	4.97	0.79	0.46
Long-Term Clients	0.24	0.24	0.00	1.00	0.18	0.16
Client Market Opportunity	-0.03	0.07	-0.53	0.64	0.04	0.06
Market Volatility	0.92	0.05	0.36	1.00	0.03	0.04
Client Distance	40.71	28.96	4.97	189.46	16.61	23.43
Supplier Size	21.19	21.48	1.00	183.00	19.22	7.13
Supplier Turnover	0.03	0.07	0.00	1.00	0.05	0.06
Domain Expertise	0.14	0.07	0.02	0.53	0.06	0.03
Occupational Expertise	0.02	0.01	0.00	0.10	0.01	0.01
Client Size	139.67	270.44	0.25	3115.60	223.84	145.46
Outsourced Patents	53.89	116.38	0.44	1157.13	99.26	46.54

Table 4.2: Correlations between variables

	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	Survival	1											
2	Supplier Diversification	0.38	1										
3	Long-Term Clients	-0.08	0.19	1									
4	Client Market Opportunity	-0.05	-0.09	0.11	1								
5	Market Volatility	-0.07	0.00	0.22	-0.07	1							
6	Client Distance	-0.01	0.27	0.14	-0.09	-0.20	1						
7	Supplier Size	0.07	0.37	0.19	-0.15	0.17	0.33	1					
8	Supplier Turnover	-0.11	-0.01	0.06	-0.01	0.00	-0.01	0.01	1				
9	Domain Expertise	0.07	0.01	0.21	-0.16	0.29	0.02	0.29	0.01	1			
10	Occupational Expertise	0.04	-0.12	-0.20	-0.15	0.04	-0.08	0.12	0.00	0.13	1		
11	Client Size	-0.01	0.18	0.44	0.17	0.22	0.10	0.16	0.04	0.10	-0.14	1	
12	Outsourced Patents	0.04	0.16	0.53	0.12	0.18	0.17	0.19	0.03	0.13	-0.18	0.69	1

Table 4.3: Determinants of supplier survival using logistic discrete-time survival analysis

Variables		(1) logit	(2) logit	(3) logit	(4) logit	(5) logit
Supplier Diversification	H1		1.9105***	1.4828***	2.1309***	1.6937***
			(0.1939)	(0.2548)	(0.2322)	(0.2727)
Supplier Diversification * Long Term Clients	H2			1.8620**		2.0570***
				(0.7924)		(0.7752)
Supplier Diversification * Client Market Opportunity	H3				4.5871***	5.3494***
					(1.5932)	(1.8300)
Long Term Clients		-2.7356***	-2.4832***	-6.2378***	-2.6118***	-6.7718***
		(0.9298)	(0.7469)	(2.0338)	(0.7128)	(1.9454)
Client Market Opportunity		-1.5331	0.1709	0.0794	-5.9570**	-7.2153**
		(3.2586)	(1.6375)	(1.8528)	(2.6633)	(3.0423)
Market Volatility		-23.8099**	-6.5658**	-8.1668**	-5.1725*	-7.0517**
		(9.9160)	(3.0675)	(3.6310)	(2.7048)	(3.2925)
Client Distance		-0.0135***	-0.0168**	-0.0188**	-0.0153*	-0.0170**
		(0.0050)	(0.0084)	(0.0086)	(0.0085)	(0.0086)
Supplier Size		0.0372***	0.0235	0.0218	0.0263	0.0254
		(0.0142)	(0.0185)	(0.0215)	(0.0189)	(0.0221)
Supplier Turnover		-5.0803*	-4.7228***	-5.4875***	-5.0907***	-6.0140***
		(2.6921)	(1.6754)	(1.5522)	(1.6460)	(1.5442)
Domain Expertise		11.3819**	7.8458**	8.2808**	8.3713**	8.9253**
		(4.6674)	(3.2902)	(3.7021)	(3.4064)	(3.9561)
Occupational Expertise		23.3328	7.5832	15.7984	10.4975	19.7857
		(23.8424)	(18.2627)	(18.7339)	(18.0546)	(18.8435)
Client Size		-0.0006	-0.0008	-0.0008	-0.0011	-0.0012
		(0.0012)	(0.0008)	(0.0008)	(0.0007)	(0.0008)
Outsourced Patents		0.0142**	0.0043	0.0025	0.0043	0.0022
		(0.0070)	(0.0036)	(0.0034)	(0.0033)	(0.0030)
Constant		25.2324***	5.3187*	7.6734**	3.5151	6.1305*
		(9.0430)	(2.9896)	(3.4882)	(2.6489)	(3.1699)
Observations		1,750	1,750	1,750	1,750	1,750
Number of Firms		214	214	214	214	214
McFadden's R-Squared		0.223	0.491	0.502	0.503	0.516
BIC'		31.256	-94.012	-91.849	-92.545	-91.371
Robust SE		YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES

Robust standard errors clustered by supplier in parentheses. Logit regressions. *** p<0.01, ** p<0.05, * p<0.1

Table 4.4: Determinants of portfolio overlap (Client Distance) between suppliers and clients

VARIABLES	(1) OLS RE
Supplier Diversification	0.0221
	(0.0577)
Long-Term Clients	-0.0710***
	(0.0254)
Client Market Opportunity	0.1270**
	(0.0616)
Market Volatility	-0.0116
	(0.0772)
Supplier Size	-0.0011***
	(0.0004)
Supplier Turnover	-0.0041
	(0.0690)
Domain Expertise	0.2463***
	(0.0823)
Occupational Expertise	1.3087***
	(0.4719)
Client Size	-0.0000
	(0.0000)
Outsourced Patents	0.0000
	(0.0001)
Constant	0.3144***
	(0.0970)
Observations	1,538
Number of Suppliers	208
Robust SE	YES
Year Dummies	YES

Robust standard errors clustered by supplier in parentheses. Coefficients from random effects OLS.
*** p<0.01, ** p<0.05, * p<0.1

Figure 4.1: Hypothesis 1. Impact of Supplier Diversification on the probability of supplier survival.

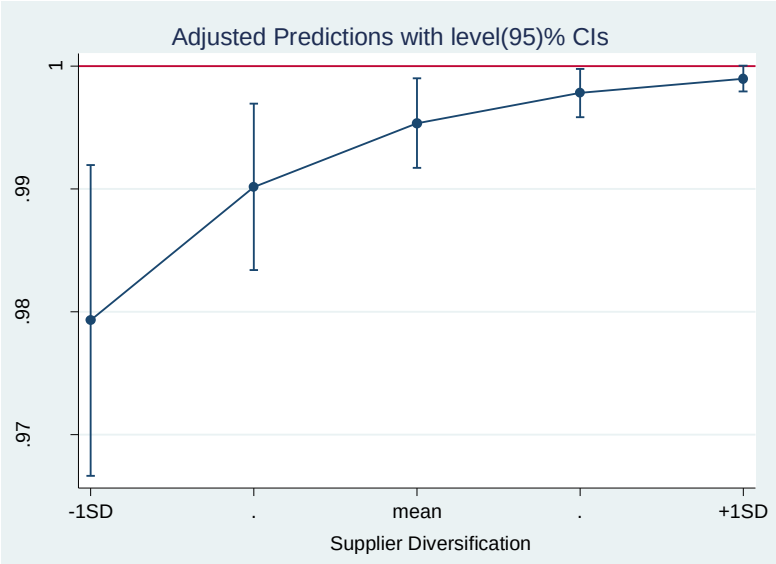


Figure 4.2: Hypothesis 1. Marginal effects of Supplier Diversification on the probability supplier survival.

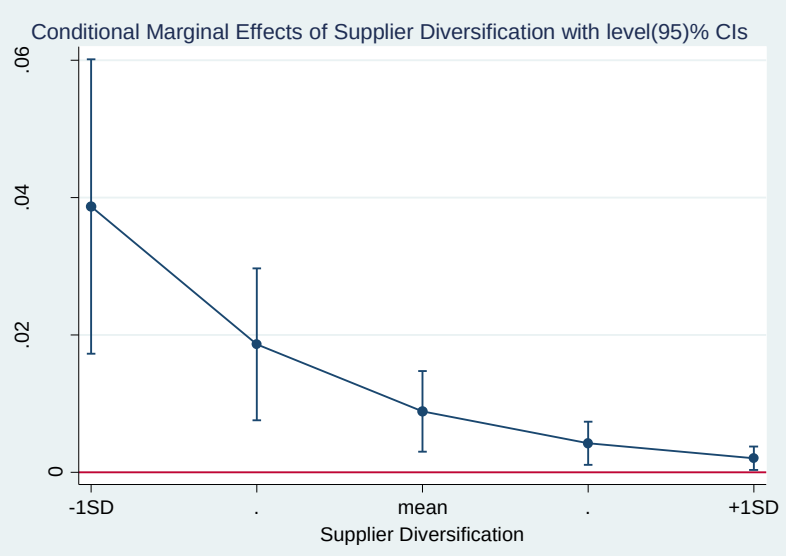


Figure 4.3: Hypothesis 2: Plotting of interaction effects for each observation

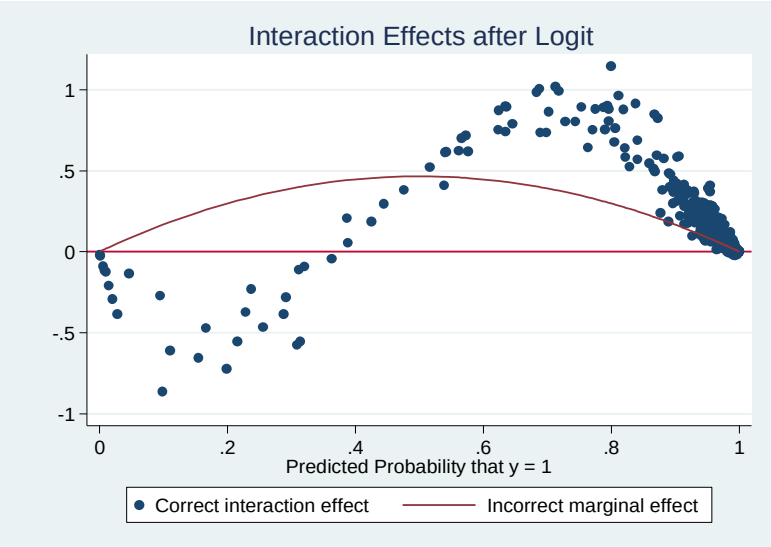


Figure 4.4: Hypothesis 2: Z-statistics of interaction effects for each observation

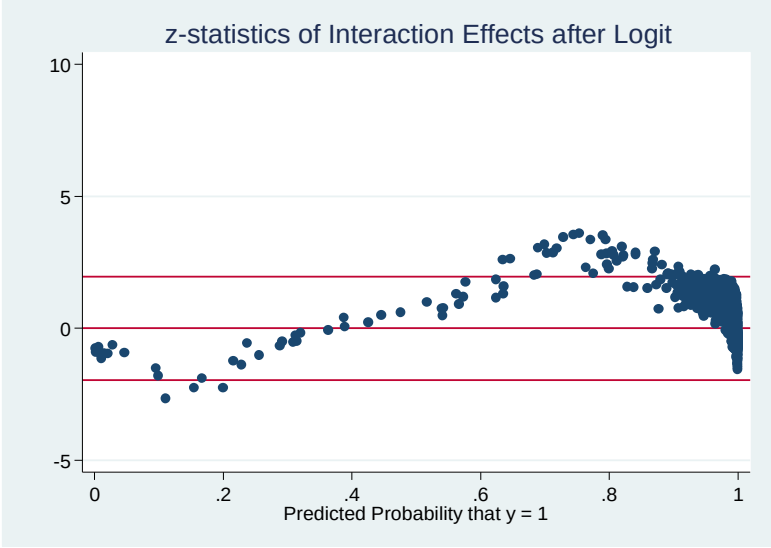


Figure 4.5: Hypothesis 3: Plotting of interaction effects for each observation

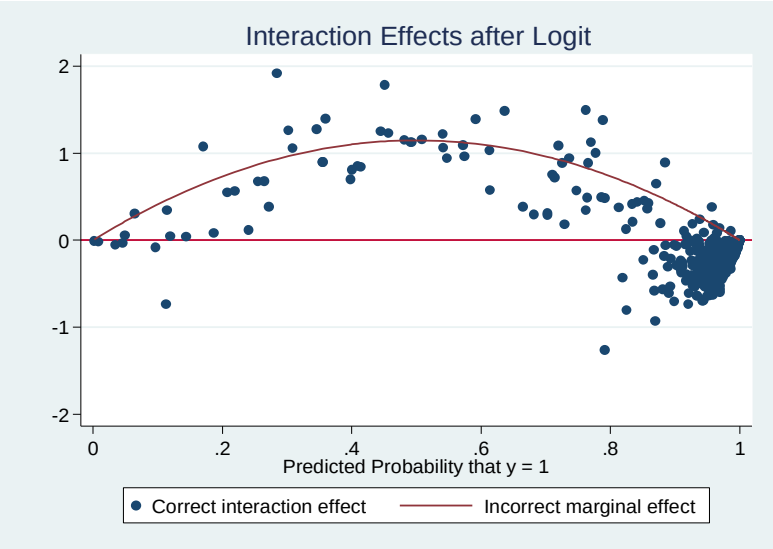
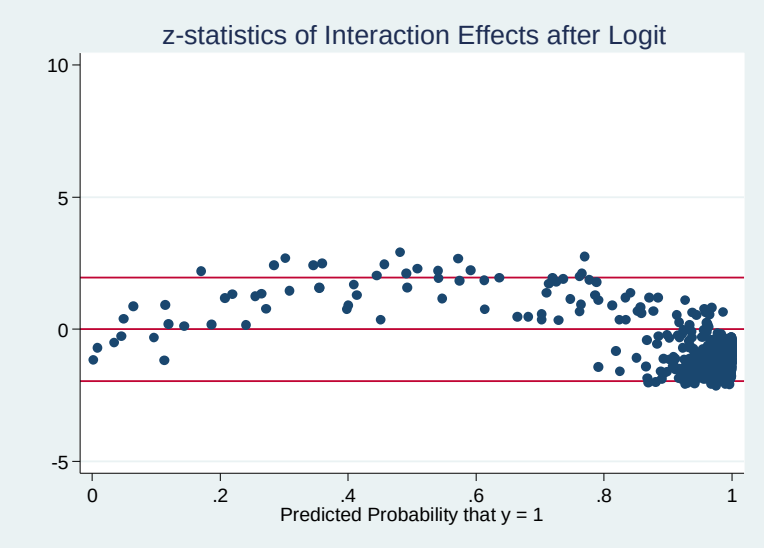


Figure 4.6: Hypothesis 3: Z-statistics of interaction effects for each observation



CHAPTER FIVE

CONCLUSION

The objective of this dissertation was to advance strategic management scholarship through examining the implications on the performance and business scope of knowledge-based service suppliers that build deeply embedded exchange relationships with their clients. Drawing from the relational view (Dyer & Singh, 1998; Kale et al., 2000) -- which theorizes exchange partners can create and capture superior levels of value through the greater use of cooperative inter-organizational relationships (Madhok & Tallman, 1998) -- I developed the rationale that irreversible relationship-specific investments (or *relational commitments*) have important implications for the ability of suppliers to (1) grow their business, (2) expand their range of services offered to clients, and (3) to survive.

This dissertation built on the insights of prior research that suggests suppliers, rather than formulating a different strategic approach for each individual client relationship, often adopt a more embedded, relational strategy *or* a more arms-length, transactional strategy to managing their *entire portfolio* of client relationships (Baker et al., 1998; Broschak, 2004; Moeen et al., 2013). Specifically, I examined the outcomes for suppliers who follow a more relational versus transactional portfolio strategy. Moreover, since the relational view is a theoretical perspective that has developed largely at the level of the dyad, the firm-level implications of relationship-specific investments are less clear. Thus, I advanced the research literature by examining whether the *dyadic*-level relational advantages predicted by relational view can also be created and captured at the *firm*-level. Across three dissertation studies, I found greater relationship-specific investments significantly impacted supplier performance and business scope; however,

the dyadic-level theoretical predictions of the relational view are not necessarily corroborated at the firm-level. Rather, under certain conditions, relationship-specific investments can result in firm-level relational hazards. I summarize my dissertation questions and main findings in Table 5.1.

While the relational view theorizes that unilateral relationship-specific investments -- such as suppliers building client-specific knowledge or developing idiosyncratic routines and processes for serving certain clients -- are important mechanisms for creating superior relationship value (e.g., Dyer, 1997), other research maintains that unilateral relationship-specific investments, in contrast, lead to negative impacts, for example, due to increased partner dependency and a higher exposure to potential partner opportunism (Baker, 1990; Sorenson & Waguespack, 2006; Williamson, 1975). These negative impacts, or *relational hazards*, can reduce the level of value the investing partner is able to appropriate from the relationship. Chapter 2 investigated this theoretical tension by examining the impact of deeper relationship-specific investments by suppliers and their clients on the long-run growth performance of suppliers. Growth performance is a highly salient and visible signal of reputation and strength for suppliers (Maister, 1993), and provides advantages for capturing high-value clients and talented employees. To emphasize the importance of growth, the leading US legal industry news outlet The National Law Journal annually publishes the top 250 US corporate law firms ranked by attorney headcount. Prior to the 2008 economic downtown, these leading law firms had grew year-on-year for over two decades (Harper, 2013).

In addition to unilateral relationship-specific investments, Chapter 2 also investigated the impact on supplier growth performance from both suppliers and their clients mutually investing to the relationship. The extant research literature maintains that mutual (or bilateral) relationship-

specific investments can maximize exchange value through greater relationship productivity and longevity, while relationship transaction costs are lowered through governing the relationship through more flexible and cooperative forms of relational contracting (Macneil, 1980; Williamson, 1979; Zajac & Olsen, 1993). Finally, one notable limitation of prior research in the relational view is that the environmental context in which relationships are formed is largely absent from empirical examination. However, we know from the dynamic capabilities literature (Eisenhardt & Martin, 2000; Teece et al., 1997; Winter, 2003) and contingency theorists (e.g., Donaldson, 2001; Lawrence & Lorsch, 1967; Thompson, 1967) that the environment is an important factor for a firm's resource management strategies (Sirmon, Hitt, & Ireland, 2007). Therefore, in fast-paced, innovative environments, supplier strategies for creating value from stable, long-term exchange relationships may compete with strategies intended to maintain strategic flexibility and enable responses to environmental fluctuations (Ghemawat & del Sol, 1998). Accordingly, chapter 2 examined the impact of fast-paced markets on supplier growth performance when suppliers follow a more relational, as opposed to discrete transactional, strategy.

The findings of chapter 2 corroborated the mutual relationship commitment proposition of the relational view (Zajac & Olsen, 1993) by showing that supplier growth performance is highest when both suppliers and clients jointly invest in exchange relationships. However, while suppliers were found to gain advantages when their clients unilaterally made themselves more dependent on suppliers, greater unilateral knowledge investments by suppliers in their clients' business did not lead to supplier growth advantages. Rather, these unilateral knowledge investments may result in growth *dis*advantages for suppliers.

One explanation for this unexpected finding may be grounded in the theoretical tension between the relational view and transaction cost economics. While the relational view maintains that client-specific knowledge can be a key driver of relationship value (Dyer & Singh, 1998; Zahra & George, 2002), transaction cost economics posits that specialized, unilateral investments restrict a firms alternative options and increase the risk of partner opportunism (Williamson, 1975). Moreover, although the productivity of a focal relationship may improve when suppliers hold deeper knowledge of their clients' business and technologies (Dyer, 1997), across a portfolio of clients these specialized relationship investments may constrain a supplier's strategic flexibility and increase barriers to new relationship formation. The surprising lack of empirical support provides compelling evidence that, counter to the predictions of the relational view, dyadic-level advantages do not necessarily translate to the firm-level.

Finally, greater relationship-specific investments by either suppliers or clients were found in chapter 2 to be hazardous for supplier growth performance when a greater fraction of a supplier's business portfolio is in higher growth markets. These results reinforce the importance of environmental attributes that impact suppliers and clients. The findings of chapter 2 are summarized in Table 5.2.

The finding that suppliers, under certain conditions, can generate performance advantages from formulating and implementing embedded client-management strategies has important implications for the next empirical dissertation study, chapter 3. Building from the logic that suppliers often have advantages in sourcing greater volumes of new business from existing clients (Chatain, 2011; Mayer et al., 2012; Maister, 1993), chapter 3 examined whether suppliers can leverage existing client relationships in their business scope strategies. The central predictions of chapter 3 were that changes in the scope of outsourced needs from a supplier's

portfolio of clients represent a significant demand-pull for suppliers to expand their scope of services into more distant (i.e., less related) lines of business, and that this "client-led diversification" effect was strengthened by greater relationship-specific investments. The theoretical underpinnings of client-led diversification were grounded in the notion that providing existing clients with services in new areas allows suppliers to gain economic advantages through generating client-specific economies of scope (Chatain & Zemsky, 2007). It also enables suppliers to draw on (and extend) previously accumulated stocks of client-specific knowledge and developed forms of mutual relationship governance to reduce the adjustment costs that may otherwise be incurred through business portfolio expansion (Helfat & Eisenhardt, 2004). As well as examining relationship-based drivers of business scope, chapter 3 also tested two alternative conditions that feasibly stimulate client-led diversification. First, when the markets of clients offer higher potential for growth and profitability than suppliers' own markets, suppliers are likely to have greater incentives to undertake client-led diversification. Second, suppliers holding greater excess resource capacity may be induced to internally redeploy those resources through business scope expansion rather than divesting through market mechanisms (Montgomery & Hariharan, 1991; Penrose, 1959; Teece, 1982).

The findings of chapter 3 revealed that changes in the scope of client needs are indeed a significant driver of changes in the business scope of suppliers; specifically, suppliers are more likely to diversify in response to diversification by their clients. However, this client-led diversification effect was found to be driven almost entirely by relationship-specific investments from suppliers and their clients. Moreover, the findings of chapter 3 show that relationship-specific investments provide incentives for suppliers to diversify *into areas less related to their current scope, in which the adjustment costs and diversification risks are theorized by extant*

literature to be greater. I also found robust empirical support for client-led diversification when suppliers hold greater excess resource capacity which they can apply to their diversification strategies. Surprisingly I found no empirical support for the prediction that greater demand in client markets relative to suppliers own markets increase the proclivity of client-led diversification. It is possible that this lack of empirical support may be driven by the suboptimal behavior of suppliers who may take on easy business from existing clients despite attractive alternative market opportunities (but which may be costly to develop), or if it is an anomaly of the data and measures. The findings of chapter 3 are provided in Table 5.3.

While chapter 3 found that greater relationship-specific investments have important implications for the composition of a supplier's portfolio of businesses, it left open the question of whether suppliers are able to capture performance advantages from relational-based strategies of business scope. Indeed, a central concern of corporate diversification research over the last few decades has been to gain an understanding of whether diversified firms outperform specialized firms (e.g., Palich et al., 2000), and whether related or unrelated diversification provides greater performance benefits (e.g., Markides & Williamson, 1994; Miller, 2006; Rumelt, 1982). Thus, a relational theory of diversification would be incomplete without an examination of the performance consequences. In my third, and final, empirical study, chapter 4, I filled this gap by investigating how a supplier's business scope, and the extent to which suppliers focus on serving existing clients, impacts the *survival* of suppliers. The scope of services that suppliers can offer to existing clients determines not only their ability to meet a greater range of their clients' needs and capture greater volumes of new business, but also the extent to which suppliers can diversify market risk, build relational advantages and economically bond clients. Thus, I first theorized and predicted that suppliers can gain survival advantages

from holding a more diversified business scope, and then I built on insights from previous research which highlight the value of long-term, enduring relationships (Dyer & Singh, 1998; Gulati, 1995; Hoetker et al., 2007; Seabright et al., 1992) to investigate whether suppliers increase their survival advantage when they dedicate a greater share of organizational resources and attention to serving long-standing clients. Finally, I examined how differences in market growth of client markets relative to supplier markets moderated the supplier scope-survival relationship.

The findings of chapter 4 corroborated the baseline prediction that suppliers increase their probability of survival when holding a more diversified portfolio of businesses. Building on the notion that existing clients are a valuable source of new business, I also found suppliers can increase their scope-survival advantage by focusing greater attention (and building dependency) on serving long-standing clients rather than ad-hoc or new clients. This result reflects the value suppliers can achieve from creating strategies for building long-term relationships, which is a core premise of both the relational view and relational contracting literatures. A final finding from chapter 4 is that greater new business opportunities in client markets, relative to supplier markets, increases supplier survival when suppliers hold a broader service scope. Thus, while chapter 3 suggests greater relative growth in client markets may not be a significant antecedent to client-led diversification, suppliers are still able to gain performance advantages from serving clients who are relatively more innovative due to greater learning opportunities, and the bonding of these important clients by meeting more of their needs. A further interesting finding from chapter 4 is that relational assets may have negative implications for supplier survival, but a broader business scope provides suppliers with a dynamic ability to manage these vulnerabilities. The findings of chapter 4 are summarized in Table 5.4.

Taken together, the findings of this dissertation provide new, and nuanced, insights into the mechanisms that drive relational advantages, but which can also lead to relational hazards. In addition, the findings cast new light onto understanding the antecedents and consequences of horizontal business scope.

In addition, it is well established that firm value creation is equal to a firm's revenues minus its costs, while its appetite for risk influences the potential revenues gain and cost implications in terms of "where and how" to compete. My dissertation provides insights into these three value creation "levers" in the context of vertical supplier-client relationships. In chapters 2 and 3, specialized relational assets of client specific knowledge and relational commitments from clients may increase supplier revenues (i.e., organizational rents) through superior returns to specialized resources (Amit & Schoemaker, 1993) and capturing a greater share of their clients' outsourced business over the longer term. These relational assets may also lower production costs due to suppliers being able to draw on a stock of client specific knowledge in meeting the new needs of clients, while their costs of managing their client relationships are lowered due to superior coordination of client interdependencies. Greater commitment from clients is also indicative of exchange relationships being governed through more efficient, cooperative governance mechanisms (Macneil, 1980; Mooen et al., 2013). These mechanisms which create superior value for suppliers also allow them to, at a lower risk, implement strategies that would ordinarily be considered higher risk, notably growing their firm (chapter 2) and diversification (chapter 3).

In chapter 4, suppliers increase their survival chances through a broader business scope. A broader scope offers greater potential for higher revenues, while a more related portfolio of businesses allows for lower production costs due to resource synergies and efficient resource

redeployment. Providing numerous services to the same client is one mechanism through which business areas can be related (even if the businesses themselves are less related in terms of underlying resources). Holding a portfolio of long-term clients allows suppliers to build significant levels of specialized relational assets which generate superior revenues (Dyer & Singh, 1998), while a deeper understanding of these clients' business lowers the costs of service provision (Chatain, 2011; Madhok & Tallman, 1998; Maister, 1993) due to reduced (or eliminated) upfront learning and relationship development costs. Moreover, the stable stream of revenues from long-term clients can allow suppliers to be either more risk averse (i.e., less need to take on risky ventures to generate revenues) *or* may allow suppliers to take on higher risk ventures, such as exploration into new domains, due to this financial buffer.

In sum, my dissertation research makes significant inroads into understanding, in more detail, the mechanisms which create value and impact strategy from vertical exchange relationships. I present the specific contributions to research and practice after discussing the limitations of this dissertation in the next section.

Limitations and Future Research

While this dissertation advances strategic management research through offering new insights into the implications of committed exchange relationships for firm-level performance and business scope, there are a number of limitations. The first limitation concerns the empirical context of US patent legal services. Although the project-level longitudinal data used across all three empirical studies allowed the construction of fine-grained, dynamic relational portfolios between suppliers and clients, this context is nonetheless highly specific and may not generalize to other contexts. In particular, this dissertation may not generalize to contexts where firms

create value from physical assets (rather than intangible, knowledge-based assets), and where strategic resource investments may require substantial sunk-cost financial commitments (e.g., a new manufacturing plant). Therefore, one clear extension to this dissertation is to test the predictions in alterative contexts where irreversible relationship-specific investments may influence firm strategy differently.

A second limitation of this dissertation is the potential generalizability to horizontal inter-organizational relationships, in particular strategic alliances. Strategic alliances are often formed with the goals of learning from the other partner or for accessing new resources (Doz, 1996; Hamel, 1991; Kale & Singh, 2007), while one partner may also take an equity stake in the other. Therefore, the relational strategies proposed in this dissertation may not apply equally, or at all, across different forms of alliances. For example, although strategic alliance research has begun to make inroads into examining the performance impacts from alliance *portfolios* (e.g., Vassolo, Anand, & Folta, 2004; Wassmer & Dussauge, 2011), strategic alliance research also suggests that partners may capture less value when they are more similar in terms of their respective knowledge bases (e.g., Gulati et al., 2009). Furthermore, it might be unlikely that a firm diversifies because of diversification by the other alliance partner; indeed, forming an alliance with a partner in a new line of business may actually substitute for the firm diversifying organically. Thus, future research may examine the predictions and findings of this dissertation within the context of different inter-organizational relationships.

A third limitation relates to a lack of direct measures for relational governance and supplier reputation. In regards to the former, relational governance is theorized in the research literature as an important mechanism for building relational advantages (Macneil, 1980; Zaheer & Venkatraman, 1995; Zaheer et al., 1998). Prior studies have typically measured relational

governance through survey (e.g., Dyer 1997; Dyer & Chu, 2003) but this tool is not suitable for large-scale longitudinal datasets as used in this dissertation. While the measures I employ may be viewed as suitable proxies, in particular *Relational (client) Commitment* (chapters 2 and 3) and *Long-Term Clients* (chapter 4), this nonetheless remains a limitation. In terms of the lack of a direct measure for supplier reputation, suppliers with a stronger reputation for quality are likely to gain benefits for both growth performance and survival as they should have advantages in gaining clients and high caliber talent (Greenwood et al., 2005). While I included control variables for the quality of firm expertise and performed additional analyses that controlled for (or removed) elite law firms, a precise, exogenous, reputation measure for all my supplier firms was not available.

A fourth limitation concerns the symptoms that can ultimately lead to supplier failure, which was the focus of chapter 4. In knowledge-based service industries, suppliers are particularly vulnerable when they suffer a sharp decline in revenues (Harper, 2013). The partnership governance structure of most modern-day knowledge-based service firms (Maister, 1993) means that firm manager-partners are residual claimants to firm profits. When firm revenues decline, the pool of firm profits to be distributed among manager-partners shrinks, which increases the risk that a supplier's best talent and clients can be poached by rivals (Teece, 2003). The loss of important clients and superior talent can quickly lead to a downward spiral where even large, apparently financially strong suppliers, are more vulnerable to failure (Harper, 2013). The limitation for this dissertation is that only the largest US corporate law firms regularly report their financial performance, and the majority of my supplier sample firms do not fall into this category. Therefore, I was unable to identify in chapter 4 whether suppliers who failed were in financial difficulty in the periods preceding the failure event. Future research may

examine client relationships of the largest law firms and see if they can detect similar patterns to my findings, or if different mechanisms result in the failure (or poorer financial performance) of these elite supplier firms.

The final limitations of this dissertation concern the impact of human capital and individual-level ties for value creation in exchange relationships. Prior studies suggest that mechanisms which underpin relational advantages, such as client-specific knowledge and trust, may reside at the inter-personal level rather than at the organizational-level (Kale et al., 2000; Zaheer et al., 1998), and this is reflected by clients switching their business between suppliers when professionals change employer (Broschak, 2004; Somaya et al., 2008). Furthermore, because the productive assets of suppliers are the knowledge and expertise of professional talent (von Nordenflycht, 2010), the business scope of suppliers is determined exclusively by the human capital of their professional workforce. Consequently, suppliers can alter their spectrum of client services and augment their portfolio of clients through the strategic hiring of new talent, while losing talent to rivals may also have significant impacts on supplier business scope and client retention (Somaya et al., 2008). In my dataset, I was unable to observe these individual-level mechanisms, and therefore I cannot rule out the potential influence of inter-personal relationships between exchange managers, or the particular areas of expertise of inbound or outbound patent attorneys, on my empirical findings. However, in my empirical tests I am able to control for the impact of outbound employee mobility in general.

In mitigation of critical relational assets that are potentially held the individual, rather than firm, level, anecdotal evidence from managers of supplier and client firms point to the importance of mechanisms that are indeed at the inter-organizational level. For example, the managing partner of a large US law firm comments that: "*The important element…is to have a*

completely integrated approach to clients which is all about information flow and making sure you have appropriate [organizational] processes in place [to manage clients' needs]".[26] Similarly, the Chief Legal Officer of a client firm (responsible for her firms' legal outsourcing strategy) notes the strong correlation between individual and organizational level factors; "*Yes you hire lawyers not firms, but typically the lawyer you are hiring is a relationship person within that firm who is providing 80% of the types of advice that you need in a particular matter*" (Coates et al., 2011: 1015). Finally, the senior manager of a management consultancy emphasized the importance of multiple ties between suppliers and clients, which again is indicative of organizational-level relationships; "*It's a bit like binding Gulliver…. Each of these individual strings may not be tough enough to hold it, so you're much better to try and have a whole range of small connections, which actually creates a whole lot of strength, I think, much more strength than one strong piece of rope which be just cut by a knife leaving you with nothing"* (Rogan, 2014: 563). Notwithstanding this anecdotal evidence, one important area of future research is to examine in more depth the correlations between mechanisms at the inter-personal and organizational-level. Sorenson and Rogan (2014) provide a useful discussion of the main considerations in this regard, and how these impact supplier firm outcomes. I turn next to the main contributions and managerial implications of this dissertation.

Contributions and Managerial Implications

Across three empirical studies, this dissertation, as a whole, makes a number of contributions to the research literature. First, I contribute to strategic management scholarship by connecting corporate-level strategy with business-level strategy. Research examinations of

[26] Quote obtained from panel discussion with law firm executives hosted by Practising Law Institute. Reproduced with permission.

which arenas firms compete in (corporate strategy) and how they should compete in those arenas (business strategy) are part of the bedrock of strategic management research. However, prior studies have, in the main, failed to make linkages between the two levels, even though in reality they are intimately connected (Rawley & Simcoe, 2010, being one notable exception). Thus, by examining the scope strategies of suppliers in concert with their strategies for managing their portfolio of clients, this dissertation represents a significant advancement in our understanding of how business strategy influences corporate strategy.

While traditional research explorations in the relational view have provided substantial insights at the level of the dyad, the potential firm-level impacts of being a more relational partner are less understood. Thus, one main contribution of this dissertation is to extend the relational view by going beyond the dyad to examine the firm-level impacts of relationship-specific investments across a supplier's *portfolio* of relationships. This portfolio-level examination also contributes to the emerging perspective in strategic alliance research that investigates portfolio-effects from a firm's entire collection of alliance partners (e.g., Vassolo et al., 2004; Wassmer & Dussauge, 2011). Furthermore, this dissertation connects the relational view to resource-based theory (e.g., Barney, 1991; Peteraf, 1993; Wernerfelt, 1984) by examining how intangible and difficult-to-imitate resources and capabilities that span organizational boundaries (as opposed to be being firm-specific) can drive firm competitive advantage (Madhok & Tallman, 1998), and in addition, pays explicit attention to demand-side mechanisms that influence supply-side capabilities. Therefore, this dissertation also contributes to nascent research in demand-side strategy (e.g., Adner & Zemsky, 2006; Priem, 2007).

Another contribution of the dissertation as a whole is to the literature that extends the unit of analysis beyond the individual transaction (e.g., Argyres & Liebeskind; Kang et al., 2009),

which is the traditional focus of transaction cost economics (Williamson, 1975). The perspective adopted in this dissertation views specialized investments as a means to capture long-term value from repeated transactions. In this way, this dissertation extends transaction cost theory, and contributes to the relational contracting (Macauley, 1963; Macneil, 1980; Zaheer & Venkatramanm 1995) and cooperative game-theory literatures (Axelrod, 1984; Vanneste & Frank, 2013) that take a longer term perspective on inter-organizational relationships.

In the chapter 2, I contribute to the relational view through a firm-level examination of whether suppliers capture performance advantages from a relational, as opposed to discrete transactional, strategy. I extend the relational view by revealing conditions under which relational advantages that are theorized to exist at the level of individual relationship also transfer to firm-level advantages. Furthermore, I identify conditions under which relationship-specific investments harm firm-level performance, and which run counter to the predictions of the relational view. In addition, my explicit theorizing on how relationship-specific investments impact firm *growth* performance contributes to recent research that criticizes management research for abstract conceptualizations of firm performance and the use of empirical measures that may not align with underlying theoretical constructs (see Miller, Washburn & Glick, 2013).

As well as connecting corporate-level strategy with business-level strategy, the second empirical study, chapter 3, specifically contributes to the cooperative strategy literature by extending the theorizing in the relational view to develop and test a theory about how relationship-specific investments impact firm-level business scope. In addition, this novel, relational theory of diversification contributes to the corporate strategy literature by providing an unexplored rationale for diversification. Furthermore, in contrast to prior resource-based studies of corporate diversification that posit firms are more likely to apply excess resource capacity

towards entering related lines of business (e.g., Penrose, 1959; Teece, 1980; 1982), I found that suppliers can apply excess resources towards entering markets that are *less* related to their current business portfolio. Therefore, I contribute to extant research on resource-based drivers of diversification.

The third empirical study, chapter 4, bridges and extends research in the relational view and corporate strategy by revealing an important interactive relationship between a supplier's business scope and its relational strategy for firm survival. I also contribute to the small body of diversification research that connects business scope to organizational mortality (e.g., Barnett & Freeman, 2001; Bercovitz & Mitchell, 2007; Sorenson et al., 2006; Stern & Henderson, 2004). Chapter 4 also contributes to and extends recent studies that examine the value suppliers can create from providing multiple services to their clients, and how these multi-service offerings increase relationship stability (Chatain, 2011; Chatain & Zemsky, 2007).

As well as contributions to scholarship, this dissertation also provides a number of managerial implications. The first managerial implication concerns the extent to which suppliers should become dependent on their existing clients for revenues. While existing clients are valuable sources of new business that can provide suppliers with competitive advantages, managers also need to consider the potential trade-offs from building embedded relational strategies that commit scarce organizational resources to those clients. For example, building embedded exchange relationships is likely to reduce strategic flexibility and could lead to constraints in building new capabilities. On the other hand, while the market frictions from relationship-specific investments may limit the ability of suppliers to capture new clients, they also reduce the risks of existing clients from being lured away by rivals (Chatain, 2011; Chatain & Zemsky, 2011).

A second managerial implication is that managers should pay due care to the emerging needs of their existing clients, as these needs can often be met at a lower cost than sourcing and establishing new clients. In particular, identifying ways in which to meet more needs of existing clients can be a fruitful avenue of increased revenues, while these clients may also be particularly valuable for reducing the risks associated with firm expansion.

A third managerial implication concerns the finding that the value of relationship-specific investments may be significantly affected by prevailing market conditions. If the future resource requirements of the market are less certain, then the net-present value of any new specialized investments may be low. Therefore, managers need to carefully consider the types of resources that will most likely be required to remain competitive in the future, and formulate client management strategies in accordance with those resource requirements.

In conclusion, this dissertation empirically revealed that suppliers can gain significant performance advantages from adopting a firm-level strategy of being a more relational partner to its clients. However, like many organizational resources, the efficacy of specialized relationship investments depends on the context in which they are applied. Thus, while extant theory in the relational view extols the benefits of deeply embedded inter-organizational relationship, the mechanisms that underpin predicted relational advantages may have the opposite effect. Therefore, this dissertation provides inroads into understanding how managers should manage its portfolio of client relationships to build competitive advantages. In addition, through building and empirically testing a novel, relational theory of diversification, this dissertation offers another avenue for future research to generate new insights into an established body of literature.

TABLES

Table 5.1: Summary of empirical chapters

Chapter	Research Question	Main Findings
Chapter 2: Relational Advantage and the Growth Performance of Knowledge-Based Service Firms	What is the effect of relational assets shared between suppliers and their clients on the long-run growth performance of suppliers?	• Joint relationship commitments from suppliers and clients provide the strongest conditions for supplier growth performance • Relationship commitments attenuate supplier growth performance in higher growth markets
Chapter 3: Relational Advantage and Partner-Driven Corporate Scope: The Case for Client-Led Diversification	To what extent do relational assets shared between suppliers and their clients determine the horizontal business scope of suppliers?	• Client diversification drives supplier diversification – "client-led diversification" • "Client-led diversification" is driven by underlying relational assets
Chapter 4: Corporate Scope and the Survival of Knowledge-Based Service Firms	How does the horizontal business scope of suppliers impact the survival of those suppliers, and what is the effect on this scope-survival relationship from relational assets shared between suppliers and their clients?	• A broader business scope increases supplier survival • Providing a greater share of business to long-term clients reinforces the supplier diversification-survival relationship • Higher growth in client markets relative to suppliers markets reinforces the supplier diversification-survival relationship

Table 5.2: Overview of hypotheses for Chapter 2

Hypothesis	**Outcome**
H1: The greater the client-specific knowledge of a supplier, the higher the growth performance of that supplier.	Not supported
H2: The greater the level of relational commitment a supplier receives from its portfolio of clients, the higher the growth performance of that supplier.	Supported
H3: The greater the client-specific knowledge of a supplier, the stronger the positive association between relational (client) commitment and the growth performance of that supplier.	Supported
H4a: The greater the growth of the markets within a supplier's portfolio, the weaker the positive association between client-specific knowledge and supplier growth performance.	Supported
H4b: The greater the growth of the markets within a supplier's portfolio, the weaker the positive association between relational (client) commitment and supplier growth performance.	Supported

Table 5.3: Overview of hypotheses for Chapter 3

Hypothesis	**Outcome**
H1. Greater diversification in the outsourcing needs of a supplier's existing clients will be associated with greater supplier diversification.	Supported
H2. The greater the level of client-specific knowledge held by a supplier (developed through prior work for clients), the stronger the effect of clients' diversification on diversification by that supplier	Supported
H3. The greater the level of relational commitment provided by clients in a supplier's portfolio, the stronger the effect of client diversification on diversification by that supplier.	Supported
H4. The higher the growth in the markets of (a supplier's) clients relative to growth in the markets of a supplier, the stronger the effect of client diversification on diversification by that supplier.	Not supported
H5. The greater the resource slack of a supplier, the stronger the effect of client diversification on diversification by that supplier.	Supported

Table 5.4: Overview of hypotheses for Chapter 4

Hypothesis	**Outcome**
H1: The greater the level of supplier diversification, the greater the probability of survival of that supplier.	Supported
H2: The greater the fraction of business in a focal supplier's business portfolio that is from long-term clients, the stronger the effect of supplier diversification on the probability of survival for that supplier.	Supported
H3: The greater the growth in the markets of (a supplier's) clients relative to growth in the markets of the supplier (Client Market Opportunity), the stronger the effect of supplier diversification on the probability of survival of that supplier.	Supported

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APPENDIX A

CHAPTER TWO ADDITIONAL ANALYSES

Table A.1: Three-year logged supplier growth using Ordinary Least Squares regression with Newey-West standard errors.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Logged Variables		3 Year Growth	3 Year Growth	3 Year Growth	3 Year Growth	3 Year Growth	3 Year Growth	3 Year Growth
Client-Specific Knowledge	H1		-0.019		-1.110**	0.088		-0.799*
			(0.034)		(0.492)	(0.075)		(0.467)
Relational (client) Commitment	H2			0.144**	-0.485*		0.572***	0.063
				(0.062)	(0.263)		(0.135)	(0.254)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				0.270**			0.206*
					(0.120)			(0.107)
Market Growth * Client-Specific Knowledge	H4a					-0.641		-0.318
						(0.417)		(0.357)
Market Growth * Relational (client) Commitment	H4b						-2.152***	-1.994***
							(0.553)	(0.515)
Market Growth		0.462*	0.437*	0.534*	0.480*	1.902**	9.192***	9.238***
		(0.268)	(0.265)	(0.274)	(0.263)	(0.938)	(2.225)	(2.306)
Client Dynamism		-0.004	-0.004	-0.003	-0.003	-0.004	-0.003	-0.003
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Outsourced Percentage (by clients)		1.584**	1.597**	1.375**	1.328**	1.613**	1.283**	1.262**
		(0.657)	(0.661)	(0.648)	(0.623)	(0.667)	(0.582)	(0.574)
Outsourced Volume (to focal supplier)		-0.004	-0.001	-0.009	-0.004	0.002	-0.012	-0.006
		(0.015)	(0.016)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)
Supplier Size		0.023	0.023	0.021	0.025	0.026	0.029	0.033
		(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.023)	(0.024)
Supplier Turnover		0.009	0.009	0.012	0.012	0.007	0.015	0.013
		(0.013)	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)	(0.012)
Supplier Scope		-0.029	-0.030	-0.038	-0.039	-0.036	-0.037	-0.041*
		(0.025)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.024)
Domain Expertise		0.041	0.042	0.047*	0.050**	0.044	0.047*	0.051**
		(0.027)	(0.026)	(0.025)	(0.025)	(0.027)	(0.024)	(0.025)
Occupational Expertise		0.066	0.067	0.048	0.054	0.070	0.039	0.045
		(0.051)	(0.051)	(0.051)	(0.050)	(0.051)	(0.048)	(0.047)
Constant		-1.587**	-1.561**	-1.941***	0.667	-1.827***	-3.582***	-1.601
		(0.630)	(0.620)	(0.685)	(1.160)	(0.665)	(0.846)	(1.235)
Observations		1,002	1,002	1,002	1,002	1,002	1,002	1,002
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.2: Four-year logged supplier growth using Ordinary Least Squares regression with Newey-West standard errors.

Logged Variables		(1) 4 Year Growth	(2) 4 Year Growth	(3) 4 Year Growth	(4) 4 Year Growth	(5) 4 Year Growth	(6) 4 Year Growth	(7) 4 Year Growth
Client-Specific Knowledge	H1		-0.051		-1.421**	0.073		-1.056*
			(0.045)		(0.610)	(0.082)		(0.586)
Relational (client) Commitment	H2			0.203***	-0.590*		0.722***	0.061
				(0.074)	(0.322)		(0.164)	(0.323)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				0.338**			0.266*
					(0.147)			(0.136)
Market Growth * Client-Specific Knowledge	H4a					-0.784*		-0.441
						(0.462)		(0.390)
Market Growth * Relational (client) Commitment	H4b						-2.844***	-2.629***
							(0.704)	(0.675)
Market Growth		0.606*	0.536	0.686**	0.592*	2.326**	12.170***	12.225***
		(0.348)	(0.331)	(0.347)	(0.326)	(1.072)	(2.890)	(2.925)
Client Dynamism		-0.003	-0.003	-0.003	-0.002	-0.003	-0.003	-0.003
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Outsourced Percentage (by clients)		2.130**	2.180**	1.768**	1.747**	2.161**	1.640**	1.629**
		(0.956)	(0.961)	(0.895)	(0.846)	(0.958)	(0.797)	(0.766)
Outsourced Volume (to focal supplier)		-0.006	0.002	-0.014	-0.003	0.004	-0.017	-0.006
		(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)
Supplier Size		0.031	0.033	0.030	0.036	0.035	0.037	0.042
		(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.028)	(0.028)
Supplier Turnover		0.018	0.018	0.023	0.022	0.016	0.025	0.023
		(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)
Supplier Scope		-0.021	-0.023	-0.033	-0.038	-0.032	-0.034	-0.043
		(0.034)	(0.034)	(0.034)	(0.032)	(0.034)	(0.033)	(0.031)
Domain Expertise		0.040	0.043	0.050	0.055*	0.046	0.049	0.055*
		(0.034)	(0.034)	(0.032)	(0.032)	(0.034)	(0.031)	(0.031)
Occupational Expertise		0.070	0.073	0.044	0.053	0.075	0.041	0.050
		(0.068)	(0.067)	(0.068)	(0.066)	(0.067)	(0.062)	(0.061)
Constant		-2.150**	-2.091**	-2.585***	0.730	-2.361**	-4.560***	-1.950
		(0.917)	(0.893)	(0.949)	(1.378)	(0.925)	(1.115)	(1.499)
Observations		876	876	876	876	876	876	876
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: Five-year growth (non-logged) growth using Ordinary Least Squares regression with Newey-West standard errors.

Non-logged variables		(1) 5 year Growth	(2) 5 year Growth	(3) 5 year Growth	(4) 5 year Growth	(5) 5 year Growth	(6) 5 year Growth	(7) 5 year Growth
Client-Specific Knowledge	H1		-0.407		-5.187**	2.575*		-1.513
			(0.642)		(2.539)	(1.376)		(2.616)
Relational (client) Commitment	H2			0.470**	-0.389		1.535***	0.840
				(0.211)	(0.458)		(0.412)	(0.519)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				8.051**			5.644
					(3.985)			(3.623)
Market Growth * Client-Specific Knowledge	H4a					-19.921**		-16.116*
						(9.611)		(9.139)
Market Growth * Relational (client) Commitment	H4b						-6.603***	-6.051***
							(2.423)	(2.199)
Market Growth		1.482**	1.427**	1.533**	1.541**	3.320***	5.304***	6.486***
		(0.629)	(0.614)	(0.608)	(0.606)	(1.166)	(1.684)	(1.967)
Client Dynamism		-0.006	-0.005	-0.006	-0.005	-0.006	-0.005	-0.005
		(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Outsourced Percentage (by clients)		0.374	0.385	0.232	0.242	0.379	0.222	0.234
		(0.281)	(0.282)	(0.275)	(0.268)	(0.280)	(0.265)	(0.260)
Outsourced Volume (to focal supplier)		-0.000	-0.000	-0.000	-0.000	0.000	-0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Supplier Size		0.001	0.001	0.001	0.001	0.001	0.001	0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Supplier Turnover		-0.016	-0.022	0.060	0.053	-0.058	0.087	0.047
		(0.271)	(0.271)	(0.262)	(0.258)	(0.273)	(0.261)	(0.261)
Supplier Scope		-0.011	-0.036	-0.246	-0.258	-0.411	-0.204	-0.535
		(1.071)	(1.063)	(1.111)	(1.041)	(1.008)	(1.049)	(0.958)
Domain Expertise		0.444	0.482	0.455	0.447	0.552	0.445	0.524
		(0.461)	(0.458)	(0.449)	(0.452)	(0.454)	(0.440)	(0.442)
Occupational Expertise		5.347	5.210	4.948	4.762	5.365	5.759	5.593
		(4.481)	(4.466)	(4.423)	(4.353)	(4.427)	(4.300)	(4.228)
Constant		-0.250	-0.207	-0.394	0.143	-0.468*	-1.020***	-0.771**
		(0.256)	(0.249)	(0.249)	(0.308)	(0.283)	(0.343)	(0.389)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Five-year compound annual growth rate using Ordinary Least Squares regression with Newey-West standard errors.

Variables		(1) 5 year CAGR	(2) 5 year CAGR	(3) 5 year CAGR	(4) 5 year CAGR	(5) 5 year CAGR	(6) 5 year CAGR	(7) 5 year CAGR
Client-Specific Knowledge	H1		-0.093		-0.974**	0.340		-0.462
			(0.118)		(0.488)	(0.209)		(0.529)
Relational (client) Commitment	H2			0.104***	-0.053		0.282***	0.150
				(0.040)	(0.078)		(0.078)	(0.096)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				1.477**			1.114
					(0.738)			(0.713)
Market Growth * Client-Specific Knowledge	H4a					-2.895**		-2.169
						(1.351)		(1.326)
Market Growth * Relational (client) Commitment	H4b						-1.102***	-1.017***
							(0.412)	(0.391)
Market Growth		0.244*	0.232*	0.255**	0.254**	0.507***	0.885***	1.034***
		(0.129)	(0.124)	(0.125)	(0.123)	(0.185)	(0.298)	(0.317)
Client Dynamism		-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Outsourced Percentage (by clients)		0.110*	0.113*	0.079	0.081	0.112*	0.077	0.080
		(0.063)	(0.063)	(0.059)	(0.058)	(0.063)	(0.057)	(0.056)
Outsourced Volume (to focal supplier)		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Supplier Size		0.000*	0.000*	0.000**	0.001**	0.000*	0.000*	0.000**
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Supplier Turnover		-0.018	-0.020	-0.002	-0.003	-0.025	0.003	-0.003
		(0.061)	(0.061)	(0.058)	(0.058)	(0.061)	(0.058)	(0.058)
Supplier Scope		-0.085	-0.090	-0.137	-0.141	-0.145	-0.130	-0.177
		(0.174)	(0.173)	(0.182)	(0.170)	(0.168)	(0.173)	(0.160)
Domain Expertise		0.075	0.084	0.078	0.078	0.094	0.076	0.089
		(0.076)	(0.075)	(0.073)	(0.073)	(0.075)	(0.072)	(0.072)
Occupational Expertise		0.185	0.153	0.096	0.054	0.176	0.231	0.189
		(0.729)	(0.738)	(0.704)	(0.701)	(0.732)	(0.652)	(0.652)
Constant		-0.082	-0.072	-0.113**	-0.013	-0.110*	-0.218***	-0.157**
		(0.056)	(0.052)	(0.057)	(0.055)	(0.058)	(0.075)	(0.075)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.5: Five-year DHS Index using Ordinary Least Squares regression with Newey-West standard errors.

Variables		(1) 5 year DHS Index	(2) 5 year DHS Index	(3) 5 year DHS Index	(4) 5 year DHS Index	(5) 5 year DHS Index	(6) 5 year DHS Index	(7) 5 year DHS Index
Client-Specific Knowledge	H1		-0.405		-4.407*	1.421		-2.282
			(0.543)		(2.259)	(0.945)		(2.491)
Relational (client) Commitment	H2			0.500***	-0.212		1.284***	0.674
				(0.187)	(0.363)		(0.356)	(0.455)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				6.700*			5.150
					(3.420)			(3.353)
Market Growth * Client-Specific Knowledge	H4a					-12.198**		-8.867
						(5.884)		(5.862)
Market Growth * Relational (client) Commitment	H4b						-4.861***	-4.479**
							(1.868)	(1.800)
Market Growth		1.113*	1.058*	1.167**	1.161**	2.217***	3.943***	4.533***
		(0.590)	(0.571)	(0.570)	(0.563)	(0.831)	(1.354)	(1.424)
Client Dynamism		-0.005	-0.005	-0.005	-0.004	-0.006	-0.005	-0.005
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Outsourced Percentage (by clients)		0.530*	0.541*	0.379	0.389	0.537*	0.372	0.384
		(0.292)	(0.295)	(0.276)	(0.270)	(0.293)	(0.267)	(0.262)
Outsourced Volume (to focal supplier)		-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Supplier Size		0.002**	0.002**	0.002**	0.003**	0.002**	0.002**	0.003**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Supplier Turnover		-0.127	-0.134	-0.047	-0.053	-0.155	-0.027	-0.053
		(0.293)	(0.293)	(0.278)	(0.274)	(0.293)	(0.277)	(0.274)
Supplier Scope		-0.406	-0.432	-0.657	-0.673	-0.661	-0.626	-0.821
		(0.763)	(0.758)	(0.793)	(0.740)	(0.742)	(0.759)	(0.704)
Domain Expertise		0.352	0.391	0.364	0.367	0.434	0.357	0.412
		(0.348)	(0.342)	(0.332)	(0.333)	(0.342)	(0.327)	(0.330)
Occupational Expertise		0.337	0.200	-0.088	-0.274	0.295	0.510	0.314
		(3.230)	(3.275)	(3.099)	(3.092)	(3.253)	(2.856)	(2.863)
Constant		-0.402	-0.358	-0.554**	-0.099	-0.518*	-1.016***	-0.721**
		(0.259)	(0.245)	(0.262)	(0.257)	(0.272)	(0.345)	(0.353)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.6: Five-year logged supplier growth using Ordinary Least Squares regression with Newey-West standard errors: Alternative market growth specification of Market Growth in the Number of Clients

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Logged variables		5 Year Growth	5 Year Growth	5 Year Growth	5 Year Growth	5 Year Growth	5 Year Growth	5 Year Growth
Client-Specific Knowledge	H1		-0.083		-1.771**	0.098		-1.577**
			(0.059)		(0.736)	(0.103)		(0.730)
Relational (client) Commitment	H2			0.257***	-0.729*		0.631***	-0.357
				(0.090)	(0.400)		(0.205)	(0.444)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				0.418**			0.406**
					(0.175)			(0.172)
Market Growth (in # clients) * Client-Specific Knowledge	H4a					-1.561**		-1.256*
						(0.753)		(0.664)
Market Growth (in # clients) * Relational (client) Commitment	H4b						-3.056**	-2.819**
							(1.334)	(1.240)
Market Growth (in # clients)		1.476**	1.338**	1.454**	1.294**	4.869***	13.820**	15.549***
		(0.598)	(0.552)	(0.576)	(0.534)	(1.823)	(5.517)	(5.229)
Client Dynamism		-0.006	-0.006	-0.006	-0.005	-0.006	-0.006	-0.005
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Outsourced Percentage (by clients)		2.751*	2.884*	1.956	2.006	2.916*	1.888	1.966
		(1.505)	(1.502)	(1.410)	(1.322)	(1.537)	(1.345)	(1.296)
Outsourced Volume (to focal supplier)		-0.006	0.006	-0.015	0.000	0.009	-0.016	0.000
		(0.024)	(0.026)	(0.024)	(0.026)	(0.026)	(0.024)	(0.026)
Supplier Size		0.045	0.048	0.048	0.054	0.050	0.049	0.058*
		(0.036)	(0.036)	(0.035)	(0.035)	(0.036)	(0.035)	(0.035)
Supplier Turnover		0.023	0.022	0.029	0.027	0.019	0.030	0.025
		(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)
Supplier Scope		-0.034	-0.037	-0.049	-0.053	-0.044	-0.046	-0.056
		(0.042)	(0.042)	(0.043)	(0.039)	(0.041)	(0.042)	(0.038)
Domain Expertise		0.021	0.025	0.038	0.043	0.033	0.037	0.049
		(0.042)	(0.042)	(0.040)	(0.039)	(0.041)	(0.039)	(0.039)
Occupational Expertise		0.064	0.066	0.040	0.051	0.069	0.043	0.055
		(0.088)	(0.087)	(0.086)	(0.084)	(0.086)	(0.083)	(0.081)
Constant		-2.795*	-2.744*	-3.024**	1.063	-3.200**	-4.483***	-0.762
		(1.461)	(1.417)	(1.432)	(1.765)	(1.509)	(1.680)	(2.056)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.7. Five-year (logged) supplier growth using Ordinary Least Squares regression with robust standard errors

Logged Variables		(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS
Client-Specific Knowledge	H1		-0.081		-1.786**	0.092		-1.484*
			(0.065)		(0.811)	(0.095)		(0.750)
Relational (client) Commitment	H2			0.268**	-0.731*		0.775***	-0.159
				(0.104)	(0.441)		(0.197)	(0.399)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				0.423**			0.380**
					(0.192)			(0.176)
Market Growth * Client-Specific Knowledge	H4a					-1.161**		-0.874*
						(0.535)		(0.491)
Market Growth * Relational (client) Commitment	H4b						-3.093***	-2.879***
							(0.935)	(0.932)
Market Growth		0.848	0.722	0.919	0.794	3.379**	13.464***	14.473***
		(0.601)	(0.554)	(0.582)	(0.544)	(1.322)	(3.907)	(3.693)
Client Dynamism		-0.006	-0.006	-0.006	-0.005	-0.006	-0.005	-0.005
		(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
Outsourced Percentage (by clients)		2.761	2.884	1.939	1.980	2.830	1.914	1.921
		(1.766)	(1.772)	(1.689)	(1.578)	(1.759)	(1.583)	(1.480)
Outsourced Volume (to focal supplier)		-0.009	0.004	-0.019	-0.004	0.007	-0.022	-0.005
		(0.025)	(0.027)	(0.025)	(0.027)	(0.027)	(0.024)	(0.026)
Supplier Size		0.046	0.049	0.047	0.054	0.052	0.051	0.060*
		(0.038)	(0.038)	(0.036)	(0.036)	(0.037)	(0.035)	(0.035)
Supplier Turnover		0.022	0.022	0.029	0.026	0.019	0.031	0.026
		(0.030)	(0.030)	(0.029)	(0.029)	(0.029)	(0.028)	(0.028)
Supplier Scope		-0.033	-0.035	-0.050	-0.053	-0.045	-0.048	-0.059
		(0.050)	(0.049)	(0.049)	(0.045)	(0.048)	(0.048)	(0.043)
Domain Expertise		0.039	0.043	0.053	0.057	0.047	0.049	0.057
		(0.053)	(0.052)	(0.048)	(0.046)	(0.051)	(0.047)	(0.046)
Occupational Expertise		0.066	0.070	0.036	0.048	0.072	0.042	0.055
		(0.096)	(0.093)	(0.094)	(0.089)	(0.092)	(0.085)	(0.081)
Constant		-2.779	-2.727	-3.025*	1.110	-3.074*	-5.068***	-1.461
		(1.722)	(1.682)	(1.714)	(1.900)	(1.718)	(1.871)	(1.897)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
R-squared		0.099	0.105	0.127	0.146	0.112	0.149	0.171
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors clustered by supplier in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.8: Main models controlling for suppliers included in the National Law Journal 250

Logged Variables		(1) 5 year Growth	(2) 5 year Growth	(3) 5 year Growth	(4) 5 year Growth	(5) 5 year Growth	(6) 5 year Growth	(7) 5 year Growth
Client-Specific Knowledge	H1		-0.071		-1.725**	0.098		-1.431**
			(0.058)		(0.717)	(0.096)		(0.704)
Relational (client) Commitment	H2			0.292***	-0.680*		0.792***	-0.116
				(0.089)	(0.389)		(0.194)	(0.399)
Client-Specific Knowledge * Relational (client) Commitment *(Mutual Commitment)*	H3				0.411**			0.369**
					(0.171)			(0.163)
Market Growth * Client-Specific Knowledge	H4a					-1.138**		-0.854*
						(0.527)		(0.495)
Market Growth * Relational (client) Commitment	H4b						-3.055***	-2.850***
							(0.987)	(0.957)
Market Growth		0.854*	0.743	0.931**	0.825*	3.348***	13.321***	14.341***
		(0.482)	(0.453)	(0.466)	(0.443)	(1.288)	(4.123)	(4.120)
Client Dynamism		-0.006	-0.006	-0.006	-0.005	-0.006	-0.006	-0.005
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Outsourced Percentage (by clients)		2.740*	2.848*	1.842	1.872	2.797*	1.819	1.817
		(1.482)	(1.487)	(1.377)	(1.303)	(1.482)	(1.285)	(1.217)
Outsourced Volume (to focal supplier)		-0.004	0.007	-0.014	-0.002	0.010	-0.017	-0.003
		(0.024)	(0.025)	(0.024)	(0.025)	(0.025)	(0.023)	(0.024)
Supplier Size		0.034	0.037	0.033	0.040	0.040	0.037	0.046
		(0.037)	(0.037)	(0.036)	(0.035)	(0.036)	(0.035)	(0.035)
Supplier Turnover		0.018	0.018	0.025	0.022	0.016	0.026	0.022
		(0.024)	(0.024)	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)
Supplier Scope		-0.044	-0.045	-0.064	-0.066*	-0.055	-0.062	-0.072**
		(0.041)	(0.041)	(0.041)	(0.038)	(0.040)	(0.040)	(0.037)
Domain Expertise		0.042	0.046	0.058	0.061	0.050	0.054	0.061
		(0.042)	(0.041)	(0.038)	(0.038)	(0.041)	(0.037)	(0.037)
Occupational Expertise		0.069	0.073	0.037	0.048	0.074	0.043	0.055
		(0.088)	(0.086)	(0.086)	(0.083)	(0.086)	(0.078)	(0.076)
NLJ Firms		**0.113***	**0.107***	**0.135****	**0.126****	**0.106***	**0.133****	**0.123****
		(0.060)	**(0.060)**	**(0.061)**	**(0.060)**	**(0.060)**	**(0.058)**	**(0.058)**
Constant		-2.757*	-2.713*	-3.021**	0.989	-3.053**	-5.038***	-1.547
		(1.437)	(1.402)	(1.381)	(1.707)	(1.437)	(1.608)	(1.923)
Observations		750	750	750	750	750	750	750
Number of Suppliers		126	126	126	126	126	126	126
Robust SE		YES	YES	YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES	YES	YES

Robust standard errors parentheses. *** p<0.01, ** p<0.05, * p<0.1

APPENDIX B

CHAPTER THREE ADDITIONAL ANALYSES

Table B.1: Sub-sample of main models with suppliers included in the National Law Journal 250 removed from the main sample

Variables		1	2	3	4	5	6
Client Diversification	H1		0.0953	-0.848***	0.0855	-0.0912	-0.947***
			(0.108)	(0.315)	(0.121)	(0.129)	(0.329)
Client Diversification * Client Specific Knowledge	H2			6.008***			5.267***
				(1.642)			(1.667)
Client Diversification * Relational (client) Commitment	H3			0.815**			0.848**
				(0.402)			(0.410)
Client Diversification * Relative Market Growth	H4				-0.189		-0.170
					(1.072)		(1.126)
Client Diversification * Supplier Excess Capacity	H5					0.0201***	0.0160**
						(0.00598)	(0.00648)
Client Specific Knowledge		-0.446**	-0.419**	-1.458***	-0.416**	-0.393**	-1.310***
		(0.184)	(0.192)	(0.383)	(0.192)	(0.190)	(0.398)
Relational (client) Commitment		-0.00748	-0.0202	-0.165*	-0.0201	0.00919	-0.147*
		(0.0440)	(0.0431)	(0.0846)	(0.0432)	(0.0424)	(0.0873)
Relative Market Growth		0.0982	0.0969	0.0781	0.133	0.108*	0.123
		(0.0605)	(0.0608)	(0.0603)	(0.234)	(0.0610)	(0.249)
Supplier Excess Capacity		0.000146	-0.000164	-0.000244	-0.000149	-0.00601***	-0.00491**
		(0.000960)	(0.000919)	(0.000920)	(0.000917)	(0.00194)	(0.00203)
Occupational Expertise		0.318	0.298	0.469	0.290	0.339	0.496
		(0.725)	(0.720)	(0.713)	(0.721)	(0.697)	(0.699)
Non-Patent Citation Share		-0.0122	0.00963	-0.0785	0.0123	0.00371	-0.0739
		(0.113)	(0.120)	(0.107)	(0.119)	(0.113)	(0.103)
Supplier Size		0.000132	1.68e-05	-0.000190	1.08e-05	3.02e-05	-0.000167
		(0.000382)	(0.000378)	(0.000328)	(0.000377)	(0.000359)	(0.000315)
Client Size		-0.0573*	-0.0620**	-0.0591**	-0.0619**	-0.0429	-0.0424
		(0.0297)	(0.0297)	(0.0263)	(0.0298)	(0.0297)	(0.0259)
Turnover		-0.00648	-0.00690	-0.00873	-0.00686	0.00854	0.00347
		(0.0365)	(0.0365)	(0.0347)	(0.0365)	(0.0376)	(0.0358)
Outsourced Percentage		-0.0441	-0.0368	-0.0463	-0.0384	-0.0433	-0.0528
		(0.0473)	(0.0493)	(0.0477)	(0.0505)	(0.0477)	(0.0472)
Constant		0.599***	0.589***	0.763***	0.591***	0.598***	0.759***
		(0.0477)	(0.0533)	(0.0732)	(0.0557)	(0.0514)	(0.0775)
Year Dummies		Y	Y	Y	Y	Y	Y
Robust Standard Errors		Y	Y	Y	Y	Y	Y
NLJ Firms		N	N	N	N	N	N
Observations		735	735	735	735	735	735
R-squared		0.157	0.160	0.205	0.160	0.181	0.218
Number of Suppliers		85	85	85	85	85	85

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table B.2: Subsample of supplier firms with high average (median) turnover

		High Turnover		
Variables		(1)	(2)	(3)
Client Diversification	H1		0.302**	-0.599*
			(0.123)	(0.323)
Client Diversification * Client Specific Knowledge	H2			5.075***
				(1.793)
Client Diversification * Relational (client) Commitment	H3			0.980*
				(0.539)
Client Specific Knowledge		-0.0347	-0.0638	-1.051***
		(0.256)	(0.249)	(0.381)
Relational (client) Commitment		0.00309	-0.0290	-0.214*
		(0.0521)	(0.0495)	(0.114)
Relative Market Growth		-0.0348	-0.0428	-0.0719
		(0.0736)	(0.0697)	(0.0712)
Supplier Excess Capacity		1.677*	1.216	1.345
		(0.989)	(0.929)	(0.926)
Occupational Expertise		0.160	0.174	0.0934
		(0.157)	(0.154)	(0.143)
Non-Patent Citation Share		0.000212	-4.11e-05	-0.000163
		(0.000411)	(0.000381)	(0.000356)
Supplier Size		-0.0488*	-0.0636***	-0.0590***
		(0.0259)	(0.0227)	(0.0217)
Client Size		0.000984	0.000102	-9.08e-05
		(0.00101)	(0.000838)	(0.000828)
Outsourced Percentage		-0.0598	-0.0380	-0.0399
		(0.0581)	(0.0657)	(0.0732)
Constant		0.479***	0.466***	0.641***
		(0.0576)	(0.0596)	(0.0716)
Year Dummies		Y	Y	Y
Robust Standard Errors		Y	Y	Y
Observations		412	412	412
R-squared		0.176	0.206	0.240
Number of Suppliers		50	50	50

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table B.3: Subsample of supplier firms with larger average (median) clients

		High Client Size		
Variables		(1)	(2)	(3)
Client Diversification	H1		0.0509	-1.521***
			(0.151)	(0.479)
Client Diversification * Client Specific Knowledge	H2			9.762***
				(3.060)
Client Diversification * Relational (client) Commitment	H3			1.235**
				(0.600)
Client Specific Knowledge		-0.681**	-0.667**	-2.561***
		(0.277)	(0.289)	(0.672)
Relational (client) Commitment		0.141**	0.132*	-0.149
		(0.0656)	(0.0685)	(0.131)
Relative Market Growth		0.164**	0.162**	0.184**
		(0.0781)	(0.0792)	(0.0768)
Supplier Excess Capacity		-0.000904	-0.00106	-0.00138*
		(0.000807)	(0.000829)	(0.000733)
Occupational Expertise		-0.546	-0.539	-0.642
		(0.756)	(0.767)	(0.788)
Non-Patent Citation Share		0.0528	0.0620	-0.0471
		(0.125)	(0.127)	(0.112)
Supplier Size		-0.000186	-0.000231	-0.000199
		(0.000387)	(0.000399)	(0.000348)
Turnover		-0.0140	-0.0151	0.00255
		(0.0460)	(0.0445)	(0.0416)
Outsourced Percentage		-0.0492	-0.0465	-0.0502
		(0.0880)	(0.0901)	(0.0805)
Constant		0.494***	0.486***	0.825***
		(0.0757)	(0.0883)	(0.127)
Year Dummies		Y	Y	Y
Robust Standard Errors		Y	Y	Y
Observations		415	415	415
R-squared		0.229	0.230	0.328
Number of Suppliers		46	46	46

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

APPENDIX C

CHAPTER FOUR ADDITIONAL ANALYSES

Table C.1: Main analyses using a concentric measure of Supplier Diversification

Variables		(1) logit	(2) logit	(3) logit	(4) logit	(5) logit
Supplier Diversification (concentric)	H1		8.0957***	7.5489***	8.8342***	7.8067***
			(1.1003)	(1.8033)	(1.2511)	(1.6814)
Supplier Diversification * Long Term Clients	H2			2.1968		4.4792
				(6.0727)		(6.2056)
Supplier Diversification * Client Market Opportunity	H3				27.4361***	29.2295***
					(10.1951)	(10.4256)
Long Term Clients		-2.7356***	-3.1086***	-4.6444	-2.9523***	-6.1021
		(0.9298)	(0.8258)	(4.0225)	(0.7843)	(4.1721)
Client Market Opportunity		-1.5331	0.6931	0.7142	-16.6067**	-17.5253**
		(3.2586)	(2.2190)	(2.3789)	(7.0304)	(7.0835)
Market Volatility		-23.8099**	-8.7640*	-8.9336*	-10.7416**	-11.0719**
		(9.9160)	(4.5503)	(4.7758)	(4.5318)	(4.4835)
Client Distance		-0.0135***	-0.0136**	-0.0139**	-0.0133**	-0.0138**
		(0.0050)	(0.0059)	(0.0061)	(0.0060)	(0.0062)
Supplier Size		0.0372***	0.0176	0.0163	0.0184	0.0162
		(0.0142)	(0.0122)	(0.0124)	(0.0121)	(0.0122)
Supplier Turnover		-5.0803*	-4.4563**	-4.5589**	-4.6689**	-4.9131***
		(2.6921)	(2.0749)	(2.0504)	(1.8320)	(1.7778)
Domain Expertise		11.3819**	9.4336***	9.6124***	9.4230***	9.8728***
		(4.6674)	(3.0098)	(3.0499)	(3.0459)	(3.1598)
Occupational Expertise		23.3328	21.8282	24.1978	22.7906	27.2956
		(23.8424)	(19.2092)	(20.4492)	(19.6001)	(20.9229)
Client Size		-0.0006	-0.0010	-0.0011	-0.0011	-0.0013
		(0.0012)	(0.0009)	(0.0010)	(0.0009)	(0.0010)
Outsourced Patents		0.0142**	0.0157**	0.0163**	0.0152**	0.0164**
		(0.0070)	(0.0067)	(0.0075)	(0.0067)	(0.0079)
Constant		25.2324***	5.8086	6.2849	7.2119*	8.1172*
		(9.0430)	(4.5265)	(4.9174)	(4.3831)	(4.2979)
Observations		1,750	1,750	1,750	1,750	1,750
Number of Firms		214	214	214	214	214
McFadden's Pseudo R-Squared		0.223	0.342	0.343	0.360	0.362
Log-Likelihood		-192.535	-163.017	-162.856	-158.688	-158.069
Bayesian Information Criterion (BIC')		31.256	-20.313	-13.168	-21.504	-15.275
Robust SE		YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.2: Main analyses using a 3-year measure of Long-Term Clients

Variables		(1) logit	(2) logit	(3) logit	(4) logit	(5) logit
Supplier Diversification	H1		1.9073***	1.6011***	2.1080***	1.7876***
			(0.2046)	(0.3077)	(0.2447)	(0.3303)
Supplier Diversification * Long Term Clients (3yr)	H2			0.7969		0.8707
				(0.7080)		(0.7794)
Supplier Diversification * Client Market Opportunity	H3				4.1232**	4.3679**
					(1.6489)	(1.8099)
Long Term Clients (3yr)		-1.9309**	-1.5253**	-2.7961*	-1.5515**	-2.9710*
		(0.9528)	(0.7420)	(1.5730)	(0.7584)	(1.7883)
Client Market Opportunity		-1.7733	0.1908	0.1252	-5.1692*	-5.5096*
		(3.0917)	(1.6118)	(1.6769)	(2.7083)	(2.8276)
Market Volatility		-24.3635**	-6.5933**	-7.1882**	-5.1418*	-5.7743*
		(10.0418)	(3.0838)	(3.3667)	(2.7897)	(3.1329)
Client Distance		-0.0137***	-0.0176**	-0.0186**	-0.0159**	-0.0169**
		(0.0049)	(0.0080)	(0.0082)	(0.0080)	(0.0082)
Supplier Size		0.0384***	0.0252	0.0242	0.0281	0.0273
		(0.0149)	(0.0179)	(0.0192)	(0.0180)	(0.0197)
Supplier Turnover		-4.8268*	-4.8126***	-5.0662***	-5.1836***	-5.4725***
		(2.6002)	(1.6013)	(1.5487)	(1.5926)	(1.5369)
Domain Expertise		11.3223**	6.9744**	6.8569**	7.5173**	7.4300**
		(4.7005)	(3.0067)	(3.0870)	(3.1081)	(3.2013)
Occupational Expertise		25.6892	7.7569	11.2357	10.9888	15.0992
		(23.5420)	(18.4968)	(20.1062)	(18.3064)	(20.5739)
Client Size		-0.0006	-0.0008	-0.0008	-0.0010*	-0.0011*
		(0.0010)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Outsourced Patents		0.0126*	0.0025	0.0016	0.0023	0.0014
		(0.0069)	(0.0027)	(0.0022)	(0.0024)	(0.0020)
Constant		26.3843***	5.7716**	6.8164**	3.9472	5.0402*
		(9.0435)	(2.9016)	(3.2031)	(2.6269)	(3.0082)
Observations		1,750	1,750	1,750	1,750	1,750
Number of Firms		214	214	214	214	214
McFadden's Pseudo R-Squared		0.209	0.481	0.484	0.491	0.494
Log-Likelihood		-196.035	-128.644	-127.920	-126.150	-125.312
Bayesian Information Criterion (BIC')		38.254	-89.060	-83.039	-86.580	-80.789
Robust SE		YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.3: Sub-sample of main models with suppliers included in the National Law Journal 250 removed from the main sample

Variables		(1) logit	(2) logit	(3) logit	(4) logit	(5) logit
Supplier Diversification	H1		1.9055***	1.4143***	2.1519***	1.6587***
			(0.1980)	(0.2600)	(0.2413)	(0.2812)
Supplier Diversification * Long Term Clients	H2			2.3097**		2.5975***
				(0.9303)		(0.9054)
Supplier Diversification * Client Market Opportunity	H3				4.8529***	5.8753***
					(1.5690)	(1.8166)
Long Term Clients		-2.5049***	-2.3695***	-7.1069***	-2.4947***	-7.8563***
		(0.9271)	(0.7496)	(2.4238)	(0.7117)	(2.3070)
Client Market Opportunity		-1.3947	0.3769	0.3296	-5.9230**	-7.4297**
		(3.2810)	(1.6842)	(1.9786)	(2.5578)	(2.9121)
Market Volatility		-23.7160**	-6.6700**	-8.3187**	-5.3029*	-7.3441**
		(10.1832)	(3.0756)	(3.6200)	(2.7642)	(3.3600)
Client Distance		-0.0126**	-0.0166*	-0.0183**	-0.0148*	-0.0158*
		(0.0051)	(0.0086)	(0.0088)	(0.0086)	(0.0087)
Supplier Size		0.0351**	0.0263	0.0251	0.0298	0.0294
		(0.0140)	(0.0185)	(0.0215)	(0.0199)	(0.0239)
Supplier Turnover		-4.9443*	-4.6992***	-5.7030***	-5.1032***	-6.3533***
		(2.6702)	(1.6973)	(1.5449)	(1.6615)	(1.5655)
Domain Expertise		10.8498**	5.8068*	5.8112*	6.1737**	6.1619*
		(4.6558)	(3.0428)	(3.1586)	(3.1250)	(3.2530)
Occupational Expertise		22.7406	4.6096	13.4193	6.7328	16.8544
		(23.4224)	(17.4707)	(17.6553)	(17.3756)	(17.9108)
Client Size		-0.0006	-0.0008	-0.0008	-0.0011	-0.0011
		(0.0011)	(0.0008)	(0.0008)	(0.0007)	(0.0008)
Outsourced Patents		0.0143**	0.0048	0.0025	0.0048	0.0022
		(0.0069)	(0.0038)	(0.0035)	(0.0035)	(0.0031)
Constant		25.0979***	5.5525*	8.1121**	3.7354	6.6540**
		(9.3072)	(3.0670)	(3.5537)	(2.7737)	(3.3308)
Observations		1,523	1,523	1,523	1,523	1,523
Number of Firms		190	190	190	190	190
NLJ Firms		NO	NO	NO	NO	NO
McFadden's Pseudo R-Squared		0.223	0.491	0.502	0.503	0.516
Log-Likelihood		-192.535	-126.168	-123.516	-123.167	-120.021
Bayesian Information Criterion (BIC')		31.256	-94.012	-91.849	-92.545	-91.371
Robust SE		YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.4: Main analyses estimated using a complementary log-log specification

Variables		(1) cloglog	(2) cloglog	(3) cloglog	(4) cloglog	(5) cloglog
Supplier Diversification	H1		0.7727***	0.5545***	0.8344***	0.6207***
			(0.0866)	(0.1041)	(0.0930)	(0.1074)
Supplier Diversification*Long Term Clients	H2			1.0588***		1.0889***
				(0.3297)		(0.3148)
Supplier Diversification*Client Market Opportunity	H3				1.5073***	1.7558***
					(0.5745)	(0.6392)
Long Term Clients		-0.8862***	-0.9056***	-3.5142***	-0.9396***	-3.6021***
		(0.2595)	(0.2618)	(0.9452)	(0.2596)	(0.8919)
Client Market Opportunity		-0.0180	0.6433	0.6060	-2.2683*	-2.7292*
		(0.6783)	(0.6685)	(0.7125)	(1.3231)	(1.4305)
Market Volatility		-6.3366***	-2.8033***	-3.3989***	-2.4575**	-3.0380***
		(1.7675)	(1.0504)	(1.1967)	(1.0051)	(1.1318)
Client Distance		-0.0047***	-0.0066***	-0.0072***	-0.0059**	-0.0063***
		(0.0017)	(0.0024)	(0.0025)	(0.0024)	(0.0024)
Supplier Size		0.0147***	0.0046	0.0039	0.0057	0.0053
		(0.0043)	(0.0051)	(0.0053)	(0.0052)	(0.0053)
Supplier Turnover		-2.3541***	-2.2809***	-2.4414***	-2.3550***	-2.5277***
		(0.7350)	(0.8602)	(0.7598)	(0.8493)	(0.7327)
Domain Expertise		2.4795***	2.6470***	2.7305***	2.7484***	2.8112***
		(0.9377)	(0.8713)	(0.9046)	(0.8590)	(0.8860)
Occupational Expertise		11.2872*	12.8715*	14.5298**	14.2245**	16.0728**
		(6.4195)	(7.0810)	(6.6800)	(7.0584)	(6.7104)
Client Size		-0.0004	-0.0004	-0.0004	-0.0004*	-0.0004*
		(0.0003)	(0.0002)	(0.0003)	(0.0002)	(0.0003)
Outsourced Patents		0.0047***	0.0018*	0.0010	0.0018*	0.0009
		(0.0018)	(0.0011)	(0.0008)	(0.0010)	(0.0008)
Constant		6.9968***	1.7839*	2.8836**	1.2556	2.3297**
		(1.6191)	(0.9760)	(1.1423)	(0.9323)	(1.0754)
Observations		1,750	1,750	1,750	1,750	1,750
Number of Suppliers		214	214	214	214	214
McFadden's Pseudo R-Squared		0.218	0.489	0.506	0.497	0.515
Log-Likelihood		-193.738	-126.693	-122.363	-124.745	-120.126
Bayesian Information Criterion (BIC')		33.66	-92.961	-94.154	-89.389	-91.161
Robust SE		YES	YES	YES	YES	YES
Year Dummies		YES	YES	YES	YES	YES

Robust standard errors clustered by supplier in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Complementary log-log regressions